INSTALLATION RESTORATION PROGRAM

DRAFT FINAL

ADDENDUM
SITE INVESTIGATION
SAMPLING AND ANALYSIS PLAN

Fed Fac Westhampton Beach Suffolk Co And Being ranked For NPL as part of private site Suffolk Airport C+D Site

106TH RESCUE GROUP
NEW YORK AIR NATIONAL GUARD
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON, NEW YORK

MAY 1994

AIR NATIONAL GUARD

Hazardous Waste Remedial Actions Program
Oak Ridge K-25 Site
Oak Ridge, Tennessee 37831-7606
Managed by MARTIN MARIETTA ENERGY SYSTEMS, INC.
For the U.S. DEPARTMENT OF ENERGY under contract DE-AC05-840R21400

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SITE INVESTIGATION
SAMPLING AND ANALYSIS PLAN

106TH RESCUE GROUP
NEW YORK AIR NATIONAL GUARD
FRANCIS S. GABRESKI AIRPORT
WESTHAMPTON BEACH, NEW YORK

MAY 1994

Submitted to:

AIR NATIONAL GUARD READINESS CENTER
Andrews Air Force Base, Maryland 20331

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HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM
Oak Ridge, Tennessee 37831-7606

Managed by:

MARTIN MARIETTA ENERGY SYSTEMS, INC.

for the
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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

ABB-ES	ABB Environmental Services, Inc.
ANGRC	Air National Guard Readiness Center
bgs	below ground surface
COC	chemicals of concern
CPT	cone penetrometer technology
DOE/HWP	Department of Energy/HAZWRAP Program
DQO	Data Quality Objective
DTW	depth to water
ELCD	electrolytic conductivity detector
FID	flame ionization detector
G	Guidance values taken from New York State Division of Water Technical and Operational Guidance Series (Ambient Water Quality Standards and Guidance Values, November 15, 1991).
GC	gas chromatograph
GC/MS	gas chromatograph/mass spectrometer
GFAA	graphite furnace atomic absorption spectrophotometer
GPR	ground penetrating radar
HAZWRAP	Hazardous Waste Remedial Actions Program
i	hydraulic gradient
IRP	Installation Restoration Program
K	hydraulic conductivity
MAP	Management Action Plan
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	not available
ne	effective porosity
ND	not detectable
NGVD	National Geodetic Vertical Datum

GLOSSARY OF ACRONYMS AND ABBREVIATIONS (cont'd)

NYANG	New York Air National Guard
NYDOH	New York Department of Health
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
P	standard is proposed
PID	photoionization detector
POC	principal organic contaminant
POL	petroleum, oil, and lubricant
ppm	parts per million
QA/QC	quality assurance/quality control
RL	reporting limit
RPD	relative percent difference
S	Secondary Federal Maximum Contaminant Level
SAP	Sampling and Analysis Plan
SB	site background
SI	Site Investigation
SOPs	Standard Operating Procedures
SVOC	semivolatile organic compound
TAGM	Technical and Administrative Guidance Memorandum
TOC	top of casing
TT	Treatment Technique Action Level
UOC	Unspecified Organic Contaminant
USEPA	United States Environmental Protection Agency
USTs	Underground Storage Tanks
ug/L	micrograms per liter
v	rate of ground-water movement
VOC	volatile organic compound
-	No promulgated standard or guidance value

1.0 INTRODUCTION

ABB Environmental Services, Inc., (ABB-ES) prepared this Addendum to the Site Investigation Sampling and Analysis Plan (SAP) under Martin Marietta Energy Systems' Hazardous Waste Remedial Actions Program (HAZWRAP) for the Air National Guard Readiness Center (ANGRC). The SAP (ABB-ES, 1991a) was developed for the Site Investigation (SI) phase of the Installation Restoration Program (IRP) being conducted at the 106th Rescue Group of the New York Air National Guard at the Francis S. Gabreski Airport (formerly the Suffolk County Air National Guard Base) in Westhampton Beach, New York. This Addendum adds two sites and changes the technical approach to be used.

1.1 Purpose of Addendum

The purpose of this Addendum is to describe the following changes to the SAP:

- Addition of Sites 10 and 11 to the SI scope of work;
- Restructuring of the Site 8 investigation;
- Discussion of previous investigations that were not included in the SAP;
- Changes in the technical approach to allow real-time data interpretation;
- Presentation of the conceptual models describing the sampling strategies rationale;

- Addition of the preliminary characterization of sludge in septic tanks and cesspools; and
- Elimination of the preliminary risk evaluation.

In addition, this Addendum discusses the deliverables to be produced during this investigation. These deliverables include data summaries and an SI report.

1.2 Objective of the Site Investigation

The objective of the SI is to confirm the possibility that releases of contaminants occurred at the sites investigated by determining the presence of these contaminants in the surface soil, subsurface soil, sediment, surface water, and ground water at these sites. Furthermore this SI is designed to quickly compile enough information to either 1) initiate any Remedial Investigations, Feasibility Studies, or Removal Actions needed, 2) develop Decision Documents (DD) to petition the State of New York to de-list the site(s) where no releases were detected, and/or 3) plan any additional sampling needed to complete the DDs.

1.3 Overview of Addendum

This Addendum is divided into five sections that describe the objectives and the approach that will be implemented to complete an SI at the base. This Addendum generally follows the same structure as the SAP and addresses only the changes associated with: (1) the addition of two sites, (2) the preliminary characterization of the sludge in septic tanks and cesspools, and (3) the use of a more streamlined technical approach. The organization of Section 3.0 has been modified to clarify the technical presentation.

The purpose of the Addendum and the objective of the SI are discussed in Section 1.0, Introduction. Section 2.0, Site History and Physical Setting, provides the site designations and locations, an outline of previous studies, and an overview of the geology including site characterization data obtained since the SAP was written. Section 3.0, Site Investigation Field Program, has been altered to refocus the SI to include: (1) a more streamlined technical approach, (2) an overview of conceptual models that have been developed for each of the sites under investigation, (3) the sampling and analytical strategy, and (4) a discussion of the assessment process for the evaluation and identification of releases of hazardous constituents to the environment. Section 4.0, Reporting, provides a description of the reporting processes through which information will be transferred to HAZWRAP and the ANGRC. These reports will include informal data transfers during field work at each of the nine sites under investigation and a Final SI Report. A project schedule for the overall performance of the SI tasks and associated activities is provided in Section 5.0.

2.0 SITE HISTORY AND PHYSICAL SETTING

The site designations for all sites proposed for the SI are presented in Subsection 2.1; the addition of Sites 10, 11, and subsites 8M through 8U to the SI occurred after the publication of the SAP. A summary of the previous investigations is presented in Subsection 2.2. The geologic and hydrogeologic setting common to all sites is discussed in Subsection 2.3.

2.1 Site Designations

The locations of all sites are illustrated on Figure 2-1. The site designation and location of the sites are:

Site 1: Aviation Gasoline Spill Site. Site 1 is located northeast of Smith Avenue on both sides of Moen Street.

Site 2: Former Hazardous Waste Storage Area. Site 2 is located adjacent to the northeast wall of Building 358.

Site 3: Former Hazardous Waste Storage Area (1984 - 1989). Site 3, the former location of Building 282, is southwest of the corner of Smith Avenue and Moen Street. This site was listed as the "Current Hazardous Waste Storage Facility" in the records search.

Site 4: Aircraft Refueling Apron Spill Site. Site 4 is the refueling apron and adjacent grassy area southeast of Building 358.

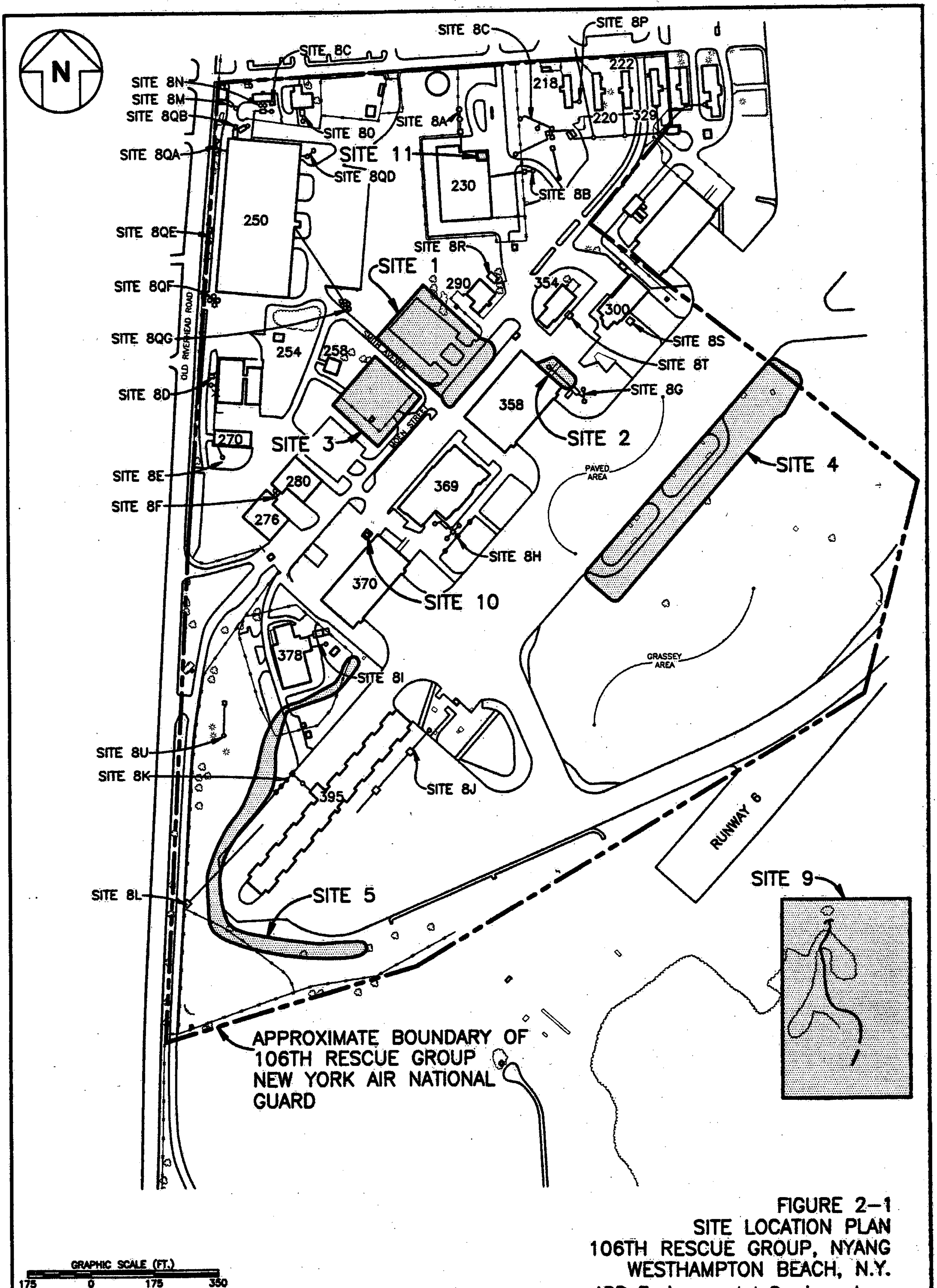

FIGURE 2-1
SITE LOCATION PLAN
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.
ABB Environmental Services, Inc.

Site 5: Southwest Storm Drainage Ditch. This site is the drainage ditch that lies west and south of Building 395. The ditch is located just off the paved area surrounding the building.

Site 8A through 8U: Old Base Septic Systems. Site 8 is a composite of cesspools, septic tanks, and dry wells that receive or received discharges from one or more buildings where industrial and/or equipment maintenance activities occur. (Refer to Table 2-1 in the SAP for additional details).

Site 9: Ramp Drainage Outfall. Site 9 is located approximately 1,100 feet south of the refueling apron (Site 4).

Site 10: Waste Stripper Tank #61, Building 370. Site 10 is located near the northwest corner of Building 370.

Site 11: Waste Oil Vessel, Building 230. Site 11 is an underground steel vessel located under Building 230 near the northeast corner of the building.

2.2 Previous Studies

A discussion of the record searches that were conducted by Dames & Moore (1986) and Hazardous Materials Technical Center (1987) is in Subsection 2.2 of the SAP. The site characterization report of Site 7 Fire Training Area written by ABB-ES (1989) recommended no further investigation and action at this site. ABB-ES conducted an additional investigation of the presence of 2-butanone in ground-water samples collected at the Fire Training Area (ABB-ES, 1992). To answer comments from the State of New York regarding the 1992 report, ABB-ES compiled the "Response to Comments from the New York State Department of Law regarding the Evaluation of 2-Butanone in Groundwater Samples Report" (ABB-ES, 1993). The status of the recommendation for no further action regarding the 2-butanone issue is pending the acceptance by NYSDEC of ABB-ES' 1992 and 1993 reports.

A cesspool/septic tank survey (sub-sites 8A through 8L) was initiated in August 1991. The results are documented in a technical memorandum by ABB-ES (1991b). Sludge and liquid samples were collected from a total of 29 structures consisting of cesspools, septic tanks, distribution boxes, dry wells, and an oil and mud trap. The samples were screened in the field for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and inorganic analytes (metals). The results indicate that VOCs and SVOCs are present in sludges from 21 of the 29 structures sampled at concentrations exceeding the action levels specified in the SAP. These activities prompted the ANGRC to add all remaining septic tanks and cesspools on the base to the IRP site list as part of Site 8.

During September 1991, ABB-ES personnel conducted a soil-gas survey at Sites 1, 2, 3, and 4. Soil gases were collected by pushing a hollow rod several inches into the ground, pulling it up slightly, and applying a vacuum. Analysis of the gas was completed using a field gas chromatograph (GC). Constituents for which analyses were performed included benzene, toluene, ethylbenzene, xylenes, trichloroethene, tetrachloroethene, trans-dichloroethene, and cis-dichloroethene. The analytical results were recorded in picograms per liter and plotted on figures. The results of the soil-gas analyses were not published.

Three monitor wells, MW-01 through MW-03, and six piezometers, PZ-01 through PZ-06, were installed in October 1991 to investigate background ground-water quality and physical conditions. Four surface soil samples, four subsurface soil samples, and ground-water samples from the three monitor wells were collected for chemical analyses. The analytical results of these samples have not been evaluated. The top-of-casing (TOC) elevations of the three monitor wells and six piezometers were surveyed in January 1992.

2.3 GEOLOGY AND HYDROGEOLOGY

A detailed description of the geology and hydrogeology is provided in Subsection 2.3 of the SAP. ABB-ES personnel obtained additional hydrogeologic data during a site visit in February 1994. A brief summary of the geology and hydrogeology and interpretation of the recent hydrogeologic data follows.

According to literature review, glacial outwash materials of the Pleistocene Epoch underlying the base consist of southward-thickening sand and gravel deposits ranging in thickness from 100 to 200 feet. The soils associated with these outwash deposits are described as deep, excessively well-drained, fine- to coarse-grained silty sand overlying thick layers of stratified coarse sand and gravel. These highly permeable deposits correspond to the upper glacial aquifer, which is the primary aquifer for the area (Nemickas and Koszalka, 1982). The Gardiners Clay, a sandy clay from 40 to 60 feet thick, unconformably underlies the Pleistocene glacial deposits but reportedly pinches out north of the base (Nemickas and Koszalka, 1982). This clay unit has a low hydraulic conductivity and was not encountered during previous drilling efforts near the base (down to 155 feet in depth). The glacial outwash material was the only unit encountered during previous drilling. This unit was described as fine- to coarse-grained sand and gravel.

During a site visit in February 1994, ABB-ES personnel measured water-levels in wells and piezometers across the base (Table 2-1). A ground-water potentiometric surface map was constructed with the data obtained on February 23, 1994 (Figure 2-2). As shown in this figure, ground water flows in a southerly direction. Depths to ground water ranged from approximately 45 feet below ground surface (bgs) at the northwest corner of the base to approximately 30 feet bgs at the southwest portion of the base near Site 5. The depth to ground water at Site 9, at the extreme southern end of the base, is estimated to be between 6 and 10 feet bgs. These depths

Table 2-1
Ground-Water Elevations
February 23, 1994

106th Rescue Group
New York Air National Guard

Piezometer or Well #	Top of Casing Elevation (feet)	Depth to Water (feet)	Ground-water Elevation (feet NGVD)
MW-01	62.65	46.72	15.93
MW-02	47.52	31.73	15.79
MW-03	47.22	31.43	15.79
PZ-01	57.76	42.72	15.04
PZ-02	45.53	30.33	15.20
PZ-03	53.80	39.56	14.24
PZ-04	49.26	34.62	14.64
PZ-05	44.04	29.38	14.66
PZ-06	43.72	30.43	13.29

Note: NGVD = National Geodetic Vertical Datum

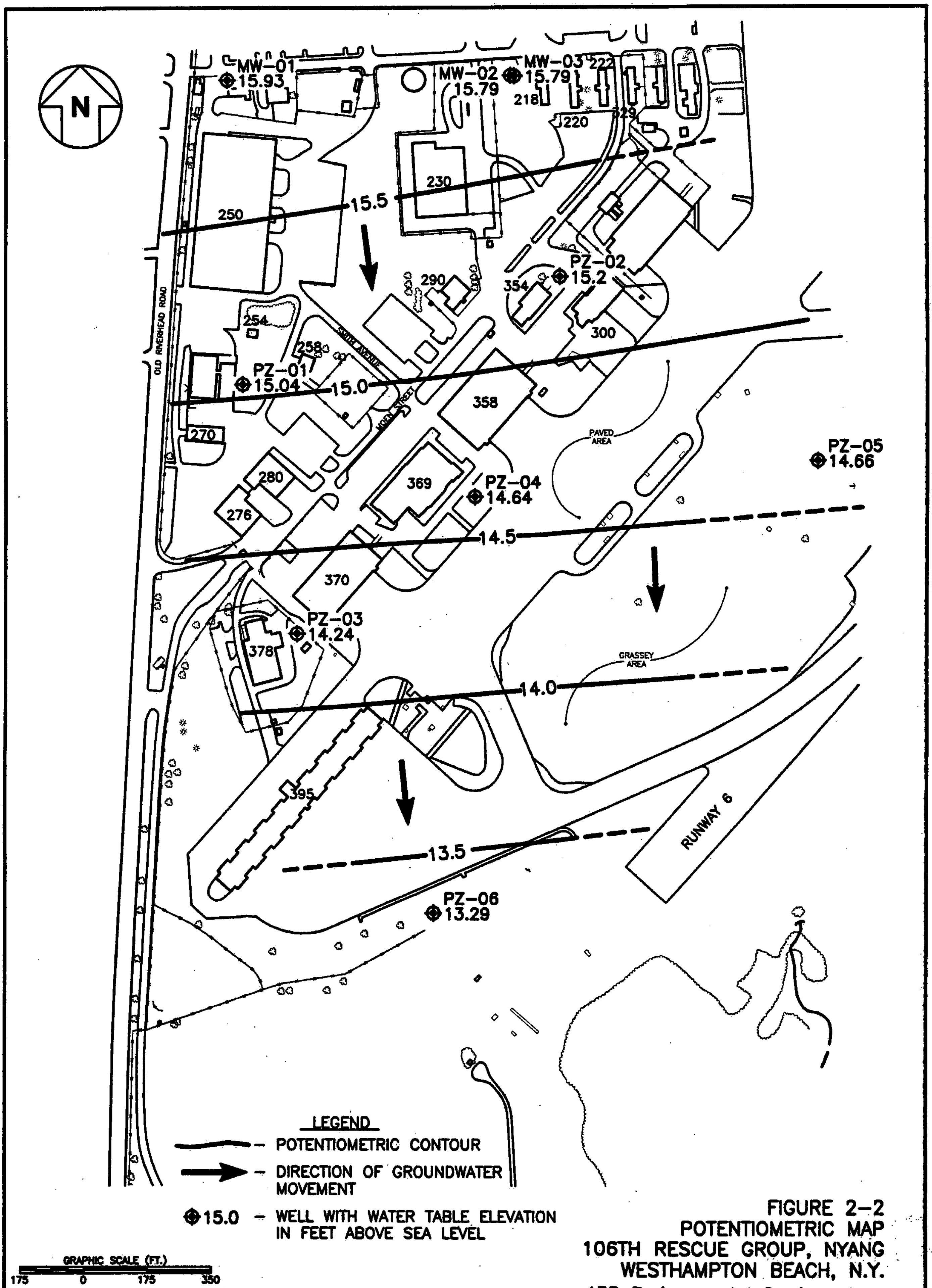

FIGURE 2–2
POTENTIOMETRIC MAP
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

were inferred by extrapolating the ground-water potentiometric contours and comparing those to the topographic elevations at Site 9.

Based on the potentiometric surface map, a hydraulic gradient of 0.001 feet per foot (ft/ft) is estimated. No vertical component of ground-water movement at the base is expected since measured water levels in a shallow and deep monitor well pair, MW-02 and MW-03, did not reflect a difference in elevation head. However, vertical components of ground-water movement may exist elsewhere at the base.

A slug test at piezometer PZ-02 was completed on February 22, 1994, during the ABB-ES site visit. The results of this test yielded a calculated hydraulic conductivity of 2.1×10^{-2} centimeters per second (4.2×10^{-2} feet per minute). This result is consistent with the range of hydraulic conductivity values reported for silty to clean sand aquifers (Freeze and Cherry, 1979).

The rate of ground-water movement, or the average linear velocity of ground-water flow (v), is estimated to be 88 feet per year from the relationship:

$$v = \frac{Ki}{n_e}$$

where K is the hydraulic conductivity, i is the estimated hydraulic gradient, and n_e is the effective porosity of the aquifer. An effective porosity of 25% or 0.25 is assumed for the aquifer (Driscoll, 1986). These estimated and/or calculated values for K, i, n_e, and v have been used in developing the hydrogeological aspects of the site conceptual models discussed later in Section 3.0.

3.0 SITE INVESTIGATION FIELD PROGRAM

The SI field program will be conducted through the integration of several technologies to expedite the sample collection, chemical analyses, data interpretation, and reporting processes. These processes will be coordinated through the use of: (1) site-specific conceptual models, (2) direct-push technologies to collect samples, (3) an on-site analytical laboratory, and (4) integrated software to minimize data manipulation, interpretation, and reporting time.

3.1 TECHNICAL APPROACH

The technical approach was initiated using the site-specific conceptual models. These models were developed to provide a synopsis of the potential release of hazardous constituents and physical conditions at each of the sites. These models discuss the following:

- operational history
- magnitude of the release
- hazardous constituents of concern and release potential
- geologic/hydrogeologic conditions
- migration/release pathway
- potentially affected media

The conceptual models are intended to be working models that will evolve as data is collected. This will allow the project team to refine data needs and locations of samples as the SI progresses. The site-specific conceptual models support the sampling strategy and contamination assessment process. Each conceptual model contains the following elements:

- a narrative discussion
- a three-dimensional drawing of the release scenario
- a sampling logic diagram

Each sampling logic diagram summarizes the contamination scenario (constituents, release history, etc.), potential release pathway(s), affected media, and sampling and analysis methodologies. The pre-set action limits for the evaluation of releases from each site are also referenced in the sampling logic diagrams. When used in this section, the word "contamination" means any substance released into the environment by human activities; it does not imply a health threat. Site-specific conceptual models and the associated sampling strategies are discussed in greater detail in Section 3.7.

The proposed methodologies include sample collection using direct-push technologies, sample analysis using an on-site analytical laboratory, and data interpretation using database systems linked with a mapping program. A brief summary of these components is presented in this section.

Direct-push technology is a method of sampling soils and ground water in a relatively expeditious manner. Soil samples are collected by pushing or hammering small-diameter rods into the subsurface and retrieving a sample from a known depth. The rods are hydraulically driven and have a sampling probe attached to the end. Soil sampling intervals are typically two feet in length. Soil sample collection time is minimized by eliminating cuttings and reducing the amount of time required for equipment decontamination. Ground-water samples are collected through the rods or through temporary small-diameter monitor wells.

Two types of direct-push technology will be used: cone penetrometer technology (CPT) and ABB-ES' TerraProbe. The TerraProbe is a GeoProbe unit mounted in a van and will be used for soil and ground-water sampling. CPT will be used for the installation of small-diameter wells and geotechnical data collection.

An on-site analytical laboratory for the analysis of VOCs, SVOCs, and metals will be established and operated by ABB-ES personnel during the field phase of the SI. The laboratory will be housed in a trailer on the base and will be equipped with gas chromatographs, mass spectrometers, and atomic absorption units. Data quality objectives for the analytical program are discussed in Subsection 3.3.6. Text files produced by the analytical equipment's software will be converted into database files. The results will be reviewed by the project chemist and will be used for interpretive purposes.

Analytical results will be linked with nonanalytical data such as geophysical and survey data. Data will be electronically transferred daily to the ABB-ES office in Knoxville where interpretation will be completed during the field operations and presented as tables, graphs, narratives, or maps. The data will also be transferred to a specified HAZWRAP subcontractor on a weekly basis.

3.2 Environmental Media Sampling

Surface soil, subsurface soil, sediment, surface water, ground water, and sludge will be sampled during the SI. Direct-push technologies (e.g., TerraProbe and CPT) will be used to collect soil and ground-water samples. Sludge samples will be collected from the cesspools with a sludge sampler. The sludge sampler will be a hand-operated bucket auger with a spring-activated trap which will hold the sample inside the auger as it is being extracted from the cesspool. Sediment samples will be collected using a stainless-steel spade. Surface water will be collected directly into sample bottles. Applicable Standard Operating Procedures (SOPs) for sample collection, decontamination, and disposition of investigation-derived waste will be included in appendices to be submitted as a separate document. Ground-water samples will be collected through the TerraProbe rods or temporary small-diameter monitor wells installed by the CPT rig. The small-diameter wells will be constructed of approximately one-inch diameter polyvinylchloride casing. No filter pack, seal or grout will be placed around the wells; subsurface materials will be allowed to collapse around the well casings and screens as the drill rods are withdrawn. The screen intervals will be ten feet in length. In the small-diameter shallow wells, the screened intervals will be placed to intersect the water table with approximately seven feet of the screen below the water table. Some well locations will also contain a well used to monitor a deeper portion of the aquifer. These deeper wells will have the top of the screen interval placed 20 feet below the bottom of the shallow well. A second round of ground-water samples will be collected from all wells before the SI is completed. The small-diameter wells will be properly abandoned in accordance with appropriate New York State Department of Environmental Conservation (NYSDEC) protocol after the second round of ground-water samples is collected (NYSDEC, 1993). Procedures for well installation and ground-water sampling using the TerraProbe will be presented in appendices to be submitted as a separate document.

All sample locations will be screened using ground penetrating radar (GPR) where intrusive sampling is planned and the precise location of underground structures and utility lines is not known. Reviews of utility maps and interviews with base personnel will be conducted to assist in the clearance of underground utilities. The GPR technique uses a high-frequency electromagnetic signal to determine the presence of subsurface objects. Interpretation of the signals enables determination of the depth, size, and location of the subsurface structures and lines.

The actual number of environmental samples collected and/or analyzed at each site will depend on interpretation of the analytical results on a daily basis. Table 3-1 lists the number (minimum and maximum) and types of samples, including Quality Assurance/Quality Control samples, to

Table 3-1
Sample Summary
For The Site Investigation

106th Rescue Group
New York Air National Guard

SITE	SURFACE WATER		SEDIMENT		SURFACE SOIL		SHALLOW SOIL		DEEP SOIL		GROUND WATER		SMALL DIA WELLS PER SITE
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
1					3	4	3	7	6	21	5	5	
2					2	4	2	4					
3					2	5	2	5	0	5			
4							4	9	12	27	3	12	3
5	5	7	5	7			3	3	3	9			
8									71	103	32	32	16
9	3	3	3	3	4	4	3	3	3	3	3	3	
10							4	4	12	22	3	9	
11							2	3	4	9	1	1	
BACKGROUND					4	4	4	4	20	20	16	16	5
SUBTOTAL	8	10	8	10	15	21	27	42	131	219	63	78	24
QA/QC													
DUPLICATES	1	1	1	1	2	3	3	4	13	22	7	8	
MATRIX SPIKE	1	1	1	1	1	1	2	2	7	11	4	4	
MS DUPLICATE	1	1	1	1	1	1	2	2	7	11	4	4	
RINSEATES	1	1	1	1	1	2	3	4	12	21	6	8	
SUBTOTAL	4	4	4	4	5	7	10	12	39	65	21	24	
FIELD BLANKS	1 Sample per Sampling Event/Shift				5 = Min		6 = Max						

TOTALS	
Minimum No. Samples	252
Maximum No. Samples	380
Minimum No. QA/QC Samples	88
Maximum No. QA/QC Samples	122
No. of Small Dia Wells	24

ANALYTES OF CONCERN

All samples will be analyzed for VOCs, SVOCs, and metals as listed on Tables 3-5 and 3-6. The only exception is for samples collected at Site 1, which will be analyzed for VOCs, SVOCs, and lead.

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be collected during this SI. The target analytes for each site and data quality objectives are presented in Subsection 3.3, Analytical Strategy.

3.3 ANALYTICAL STRATEGY

Field-laboratory analyses will be used to evaluate whether contamination is present at each site. The field analyses will be performed at HAZWRAP-level B in accordance with HAZWRAP document Department of Energy/HAZWRAP Program (DOE/HWP) 65/R1, DOE/HWP-69/R1, DOE/HWP-100 (HAZWRAP, 1990a, 1990b, and 1990c) and in conjunction with pre-approved ABB-ES SOPs.

3.3.1 Volatile Organic Compound Analyses. Analyses for VOCs will be performed using gas chromatography techniques. Two Hewlett-Packard HP5890 Series II GCs equipped with electrolytic conductivity detectors and photoionization detectors will be used for the analyses. The GCs will be equipped with DB-624, 0.53 millimeter, 30 meter, megabore columns (or equivalent) for compound separation and identification.

Each GC will be connected to a purge and trap concentration device. One GC will be connected to a Tekmar LSC 3000 single analysis unit, while the other GC will have Tekmar 2016 multiport autosampler attached. Sample throughput may be as high as 24 analytical samples per day for both GCs combined.

Data will be collected and electronically stored using HP3365 software and the ChemStation System. Data will be evaluated and converted to database files.

The reporting limit for the selected target VOCs is expected to be 1 to 5 parts per billion (actual method detection limits will be determined on site at the start of the field program).

3.3.2 Semivolatile Organic Compound Analyses. Analyses for SVOCs will be performed using two tabletop Gas chromatograph/mass spectrometer (GC/MS) systems (HP5890 GC/HP5971A MSD or equivalent) equipped with an autosampler. DB-5, 30 meter, microbore columns (or equivalent) will be used for compound separation. A vendor-supplied GC/MS National Institute of Standards and Technology library will be used in conjunction with known standards to identify unknown compounds.

Soil and water samples will be analyzed for selected SVOCs. Sample throughput may be as high as 24 analytical samples per day.

The reporting limit for individual SVOCs in soil is expected to be 1 to 5 parts per million (ppm). Reporting limits for individual SVOCs in water are expected to be between 10 and 50 micrograms per liter ($\mu g/\ell$) (actual method detection limits will be determined on site at the start of the field program).

3.3.3 Inorganic Analyses. Seven of the Resource Conservation Recovery Act metals (mercury was not included) were selected as indicator elements. Mercury was not selected for two reasons; 1) the information available shows that mercury is not a contaminant of concern and 2) the effort and equipment required to analyze for mercury is not practical for this SI. Metals analyses will be performed using a tabletop graphite furnace atomic absorption spectrophotometer (GFAA), a Varian Spectraa-400Zeeman spectrophotometer.

Sample throughput for all seven elements may be as high as 24 analytical samples per day. The reporting limit for soil analyses is expected to be 0.20 ppm for all elements. The reporting limit for water analyses is expected to be 10 $\mu g/\ell$ (actual method detection limits will be determined on site before starting analysis).

3.3.4 Quality Control Samples. Quality control samples selected by the field crew will be analyzed along with the routine analytical samples. These will include:

- Equipment rinseates, 10% of samples per matrix per equipment type.
- Field blanks, one per source per event.
- Duplicates, 10% per matrix.
- Matrix spike & matrix spike duplicates, 5% per matrix.

3.3.5 Total Organic Carbon Analyses

Two samples each of surface soil, shallow soil, and deep soil will be collected during background sampling and analyzed for total organic carbon using USEPA SAS Lloyd Kahn Method. This will be done in order to characterize background concentrations of total organic carbon at three horizons in the soil profile. The total organic carbon data will be obtained to support subsequent investigations. This data will be used in accordance with NYSDEC Memorandum HWR-94-4046 (Revised 01/24/94) to determine soil cleanup levels. The data will also be useful in predicting fate and transport characteristics of any contamination detected in the soil profile.

3.3.6 Data Quality Objectives

Data Quality Objectives (DQOs) for measuring data precision, accuracy, representativeness, comparability, and completeness are described in the following paragraphs. The DQOs for the SI analytical program are presented by medium and parameter in Table 3-2.

Table 3-2
Data Quality Objectives for the Site Investigation Analytical Program

106th Rescue Group
New York Air National Guard

MEDIA	FIELD LABORATORY ANALYSIS	PARAMETER	METHOD	DQO LEVEL
Ground Water/ Surface Water	Field	VOCs SVOCs Metals	GC/ELCD/PID GC/MS GFAA	B B B
Soils/Sediments	Field	VOCs VOCs SVOCs Metals	FID GC/ELCD/PID GC/MS GFAA	A B B B
Cesspool Sludge	Field	VOCs VOCs SVOCs Metals	FID GC/ELCD/PID GC/MS GFAA	A B B B

Notes:

GC/ELCD/PID = Gas Chromatograph/Electrolytic Conductivity Detector/Photoionization Detector
FID = Flame Ionization Detector (for measurements during sample collection)
GFAA = Graphite Furnace Atomic Absorption Spectrophotometer
Metals = Resource Conservation Recovery Act Metals
SVOC = Semivolatile Organic Compounds
VOC = Volatile Organic Compounds
Field = Target compounds to be selected

Precision and Accuracy

Precision refers to the reproducibility of a measurement under certain specified conditions, and accuracy measures the bias associated with the sampling and analysis process. Precision and accuracy are affected by both sampling and field laboratory conditions. Precision will be monitored through the analysis of field duplicate samples; accuracy will be measured through the analysis of matrix spikes and surrogate spikes. The criteria outlined in SW-846 Methods 8010A and 8020 for VOCs, 8270A for SVOCs, and 7000 series for metals will be used to assess the precision and accuracy of the field analyses (Tables 3-3 and 3-4).

Representativeness

Measurements will be made so that the results obtained are representative of the sampling population, the medium (e.g., soil or ground water), and the site conditions. The sampling protocols were developed to ensure that the samples will be representative of the media, that sampling locations will be properly selected, and that a sufficient number of samples will be collected. Sample handling protocols (chain-of-custody, storage, and transportation) are designed to preserve the sample integrity.

Completeness

The characteristic of completeness is defined as the percent of usable data as determined by the evaluation process as compared to what would be expected under normal conditions. The field laboratory is expected to meet 90% usability.

Comparability

The characteristic of comparability reflects both the internal consistency of measurements and the expression of results in units which are consistent with other organizations reporting similar

Table 3-3
Precision (RPD for duplicates and MS/MSDs)

106th Rescue Group
New York Air National Guard

Parameter	Water	Soil
Volatile Organic Compounds	30%	50%
Semivolatile Organic Compounds	30%	50%
Metals (Inorganic analytes)	30%	50%

Table 3-4
Accuracy (Percentage recovery for surrogates and MS/MSDs)

106th Rescue Group
New York Air National Guard

Parameter	Water	Soil
Volatile Surrogate	50-150	30-200
4-Bromofluorobenzene		
Semivolatile Surrogates		
Nitrobenzene-d5	35-114	23-120
2-Fluorobiphenyl	43-116	30-115
p-Terphenyl-d14	33-141	18-137
Phenol-d6	10-94	24-113
2-Fluorophenol	21-100	25-121
2,4,6-Tribromophenol	10-123	19-122
Volatile halogenated compounds, MS/MSD		
1,1-Dichloroethene	28-167	28-167
1,1-Dichloroethane	47-132	47-132
cis-1,2-Dichloroethene	38-155	38-155
trans-1,2-Dichloroethene	38-155	38-155
Chloroform	49-133	49-133
1,1,1-Trichloroethane	41-138	41-138
Trichloroethene	35-146	35-146
Tetrachloroethene	26-162	26-162

Table 3-4 (cont'd)
Accuracy (Percentage recovery for surrogates and MS/MSDs)

106th Rescue Group
New York Air National Guard

Parameter	Water	Soil
Volatile organic compounds, MS/MSD		
Benzene	39-150	39-150
Toluene	46-148	46-148
Ethylbenzene	32-160	32-160
Chlorobenzene	55-135	55-135
m-Xylene	50-150*	50-150*
p-Xylene	50-150*	50-150*
o-Xylene	50-150*	50-150*
1,2-Dichlorobenzene	37-154	37-154
1,3-Dichlorobenzene	50-141	50-141
1,4-dichlorobenzene	42-143	42-143
Naphthalene	21-133	21-133
Semivolatiles organic compounds, MS/MSD		
1,2,4-Trichlorobenzene	39-98	23-120
Acenaphthene	46-118	31-137
2,4-Dinitrotoluene	24-96	28-89
1,4-dichlorobenzene	26-127	35-142
Phenol	36-97	28-104
2-Chlorophenol	12-89	26-90
4-Chloro-3-methylphenol	27-123	25-102
4-Nitrophenol	23-97	26-103
Pentachlorophenol	10-80	11-114
Metals, MS/MSD		
Arsenic	75-125	75-125
Barium	75-125	75-125
Cadmium	75-125	75-125
Chromium	75-125	75-125
Lead	75-125	75-125
Selenium	75-125	75-125
Silver	75-125	75-125

* No criteria has been established in SW-846 for xylenes; guidance criteria is listed.

Notes: RPD = Relative Percentage Difference MS/MSD = Matrix Spike/Matrix Spike Duplicate data. Each value reported for a given measurement will be similar to other values within the same data set and with other related data sets. Comparability is being accomplished through the use of standardized sampling procedures and Modified SW-846 analytical methods that meet HAZWRAP quality control protocols.

3.3.7 Data Evaluation

Data generated in the field will be available to the project team on a real-time basis for decision making. This data will be initially released by the on-site lead chemist as preliminary data. At the completion of each day, all field data (including electronic data, copies of pertinent logbook pages, raw data, and calculations) will be sent to the project chemist for a formal evaluation that includes qualification of the data where appropriate. The procedure for the data evaluations is in accordance with HAZWRAP protocols and is provided in Appendix B, Site-Specific Quality Assurance Project Plan. The evaluation will include the following:

- field blanks and method blanks for potential laboratory or field sampling contamination,
- field duplicates to assess sampling precision and environmental matrix heterogeneity,
- matrix spike/matrix spike duplicate recoveries for analytical precision and accuracy, and
- initial and continuing calibration for analytical precision and accuracy.

Once the data has been reviewed and flagged by the project chemist, it will be transmitted back to the project team as interim data. The evaluation is expected to be within 24 hours of receipt from the field. Interim data will be final when the report tables are generated, reviewed for transcription errors, and presented in the SI report.

3.4 Survey Control

Various phases of surveys are proposed for this SI. A base-wide survey was completed during a previous phase. During the SI, samples will be obtained in areas of potential contamination and potential contamination migration. Baselines will be established at each site. These baselines will be used to quickly obtain sample locations to support the real-time data interpretations. After completion of the small-diameter wells, the vertical elevation will also be measured for each well. The following subsections summarize these survey methods.

3.4.1 Status of Existing Survey Data

Initial surveys at the base included aerial photogrammetric and ground surveying techniques. The result of these surveys was a base-wide map showing ground-surface elevations (two-foot contours) and physical structures at the base. Monitor wells and piezometers installed for the background portion of the SI were also located on the base map, and the reference point elevations were determined. Several benchmarks based on a United States Geological Survey benchmark were established across the base during the survey and are shown on this map. Survey data collected during this SI will be incorporated into this database.

3.4.2 Baseline Surveys

Baselines will be established at each site by a surveyor. Sample locations will be determined by measuring from the baseline in a direction parallel or perpendicular to the baseline. Elevations of the sample locations will be determined during the field work by using a laser-level instrument and stadia. The elevation of the instrument will be determined using one of the previously established benchmarks. Temporary reference-point elevations for the small-diameter wells will be obtained using the same method.

3.4.3 Final Survey

A final survey to obtain the vertical and horizontal positions of the monitor wells will be completed by a New York state-certified surveyor. A revised map showing the additional sample locations and monitor wells will be produced. Elevations will be based on the National Geodetic Vertical Datum of 1929.

3.5 AQUIFER CHARACTERIZATION

Hydraulic and geologic characteristics of the surficial aquifer underlying the base will be evaluated by analyzing boring data, ground-water levels in the wells, and data from slug tests.

3.5.1 Geologic Characteristics

The geologic or soil characteristics of the unsaturated and saturated zones will be evaluated during sample collection and boring operations. The soil samples will be classified and described in accordance with the Unified Soil Classification System. In addition, three borings will be advanced to approximately 60 feet at three locations using CPT and a geophysical probe to evaluate the underlying soil and relative soil density.

3.5.2 Hydraulic Characteristics

Three rounds of water-table measurements will be collected from the existing monitor wells and piezometers and from the small-diameter wells installed during this SI. The TOC elevations will be determined for all wells so that water-table elevations can be evaluated. These water-table elevations will be used to infer direction of ground-water movement.

Rising and/or falling head aquifer slug tests will be conducted at the existing monitor wells MW-01, MW-02, MW-03 and at piezometers PZ-01, PZ-02, PZ-03, and PZ-04 to evaluate hydraulic conductivity in the shallow aquifer. The tests will quantify the homogeneous nature of the aquifer across the base. The slug-test data will be reduced and analyzed by the Bouwer-Rice method for unconfined aquifers using AQTESOLV™ (Geraghty and Miller, 1991; Bouwer and Rice, 1976), an analytical computer program.

3.6 CONTAMINATION ASSESSMENT

Action levels for ground water, surface water, soil and sediment are discussed in Subsection 3.6.1, and data management and interpretation are presented in Subsection 3.6.2.

3.6.1 Action Levels

This section contains action levels (chemical concentrations) for ground water, surface water, soil, and sediment to direct sample collection in the field. The decision to sample at secondary locations is based on whether the analytical results of the initial samples are above or below these action levels. Promulgated criteria are used as action levels for ground water and surface water. Because no promulgated guidance exists for soil and sediment, soil-cleanup levels provided by NYSDEC (1994) will be used as the action levels for this SI. If the promulgated criterion (ground water and surface water) or recommended soil-cleanup level (soil and sediment) is less than the reporting limit, then the reporting limit will be used as the action level.

The action levels for ground water and surface water are provided in Table 3-5. This table lists all promulgated criteria considered as potential action levels for ground water and surface water as well as the anticipated reporting limit of the on-site analytical laboratory. The selected action levels are highlighted by shading for easy reference.

The action levels for soil and sediment are the soil-cleanup levels established by NYSDEC (1994), Table 3-6. Because NYSDEC uses the water/soil partitioning theory model to determine soil cleanup levels at Superfund sites, there are separate action levels (cleanup levels) for saturated soils and unsaturated soils. According to NYSDEC guidance, an unsaturated soil is more than 5 feet above the water table. Soil cleanup levels are not applicable if a soil exhibits a discernible odor nuisance. Soil with a discernible odor of a particular chemical or substance cannot be considered clean even if it meets the numerical criteria.

3.6.2 Data Management and Interpretation

ABB-ES has developed an integrated data management system to compile field-generated analytical results into a usable format and produce real-time interpretation of site conditions. These databases and other software assist sample tracking, produce text output from GC/MS and AA output, convert the text output into a standard database format, and manipulate the data into an interpretable form such as figures, tables, or graphs. Data are generated and entered on a

Table 3-5
Action Levels for Ground Water and Surface Water

106th Rescue Group
New York Air National Guard

Analyte	Ground Water: USEPA MCL (ug/L)	Ground Water: USEPA MCLG (ug/L)	Ground Water: NYS Class GA Ground Water (ug/L)	Ground Water: NYDOH Drinking Water MCLs (ug/L)	Surface Water: NYSDEC (ug/L)	Reporting Limit (ug/L)
Volatile Organic Compounds						
Benzene	5	0	0.7	5[1]	–	1
Chlorobenzene	100	100	5	5[1]	5 G[2]	1
Chloroform	100		7	100	–	1
1,1-Dichloroethane	–	–	5	5[1]	–	1
1,1-Dichloroethene	7	7	5	5[1]	–	1
1,2-Dichloroethene (total)	70	70	5	5[1]	–	1
Ethylbenzene	700	700	5	5[1]	–	1
Tetrachloroethene	5	0	5	5[1]	–	1
Toluene	1,000	1,000	5	5[1]	–	1
1,1,1-Trichloroethane	200	200	5	5[1]	–	1
Trichloroethene	5	0	5	5[1]	–	1
Xylenes	10,000	10,000	5	5[1]	–	1
Semivolatile Organic Compounds						
Acenaphthene	–	–	20 G	50[3]	–	10-50
Acenaphthylene	–	–	–	50[3]	–	10-50
Anthracene	–	–	50 G	50[3]	–	10-50
Benzo(a)anthracene	0.1 P	0 P	0.002 G	50[3]	–	10-50
Benzo(a)pyrene	0.2	0	ND	50[3]	–	10-50
Benzo(b)fluoranthene	0.2 P	0 P	0.002 G	50[3]	–	10-50
Benzo(g,h,i)perylene	–	–	–	50[3]	–	10-50
Benzo(k)fluoranthene	0.2 P	0 P	0.002 G	50[3]	–	10-50
bis(2-Ethylhexyl)phthalate[5]	6	0	50	50[3]	0.6[2]	10-50
Butyl benzyl phthalate	100 P	0 P	50 G	50[3]	–	10-50
4-Chloro-3-methylphenol	–	–	1[4]	50[3]	–	10-50
2-Chloronaphthalene	–	–	10 G	50[3]	–	10-50
2-Chlorophenol	–	–	1[4]	50[3]	–	10-50
Chrysene	0.2 P	0 P	0.002 G	50[3]	–	10-50
Dibenzofuran	–	–	–	50[3]	–	10-50
Dibenz(a,h)anthracene	0.3 P	0 P	–	50[3]	–	10-50
1,2-Dichlorobenzene	75	75	4.7	5[1]	–	10-50
1,3-Dichlorobenzene	500	500	5	5[1]	–	10-50
1,4-Dichlorobenzene	75	75	4.7	5[1]	–	10-50
2,4-Dichlorophenol	–	–	1[4]	50[3]	–	10-50
Diethyl phthalate	–	–	50 G	50[3]	–	10-50
Dimethyl phthalate	–	–	50 G	50[3]	–	10-50
2,4-Dimethylphenol	–	–	1[4]	50[3]	–	10-50
Di-n-butyl phthalate	–	–	–	50[3]	–	10-50
Di-n-octyl phthalate	–	–	50 G	50[3]	–	10-50
2,4-Dinitrophenol	–	–	1[4]	50[3]	–	10-50
2,4-Dinitrotoluene	–	–	5[6]	5[1]	–	10-50
2,6-Dinitrotoluene	–	–	5	5[1]	–	10-50
4,6-Dinitro-2-methylphenol	–	–	1[4]	50[3]	–	10-50
Fluoranthene	–	–	50 G	50[3]	–	10-50
Fluorene	–	–	50 G	50[3]	–	10-50
Hexachlorobenzene	1	0	0.35	50[3]	–	10-50
Hexachlorobutadiene	–	–	5	5[1]	–	10-50
Hexachlorocyclopentadiene	50	50	5	50[3]	–	10-50

See notes at end of table

Table 3–5 (cont'd)
Action Levels for Ground Water and Surface Water

106th Rescue Group
New York Air National Guard

Analyte	Ground Water				Surface Water	Reporting Limit (ug/L)
	USEPA MCL (ug/L))	USEPA MCLG (ug/L)	NYS Class GA Ground Water (ug/L)	NYDOH Drinking Water MCLs (ug/L)	NYSDEC (ug/L)	
Semivolatile Organic Compounds						
Hexachloroethane	–	–	5[6]	5[1]	–	10–50
Indeno(1,2,3–cd)pyrene	0.4 P	0 P	0.002 G	50[3]	–	10–50
Isophorone	–	–	50 G	50[3]	–	10–50
2–Methylnaphthalene	–	–	–	50[3]	–	10–50
2–Methylphenol	–	–	1[4]	50[3]	–	10–50
4–Methylphenol	–	–	1[4]	50[3]	–	10–50
Naphthalene	–	–	10 G	50[3]	–	10–50
Nitrobenzene	–	–	5	50[3]	–	10–50
2–Nitrophenol	–	–	1[4]	50[3]	–	10–50
4–Nitrophenol	–	–	1[4]	50[3]	–	10–50
2,2'–oxybis(1–chloropropane)	–	–	–	50[3]	–	10–50
Pentachlorophenol	1	0	1[4]	50[3]	0.4[2]	10–50
Phenanthrene	–	–	50 G	50[3]	–	10–50
Phenol	–	–	1[4]	50[3]	5.0[7]	10–50
Pyrene	–	–	50 G	50[3]	–	10–50
1,2,4–Trichlorobenzene	70	70	5[6]	5[1]	50[7]	10–50
2,4,5–Trichlorophenol	–	–	1[4]	50[3]	–	10–50
2,4,6–Trichlorophenol	–	–	1[4]	50[3]	–	10–50
Inorganic Constituents						
Arsenic	50[8]	–	25	50	120[9,10]	10
Barium	2000	2000	1000	–	–	10
Cadmium	5	5	10	10	21[9]	10
Chromium	100	100	50	50	–	10
Lead	TT 15[12]	0[12]	25	50	220[9]	10
Selenium	50	50	10	10	1.0[11]	10
Silver	100 S	–	50	50	2.3[9]	10

Notes:

Action Levels are shaded.

SOURCES: USEPA, 1992. Drinking Water Regulations and Health Advisories, Office of Water, Washington, D.C., December.
NYSDEC, 1993. "Ambient Water Quality Standards and Guidance Values", Memorandum by the Division of Water Technical and Operational Guidance Series (1.1.1) October 22.
State of New York, 1993. New York Public Water Supply Regulations, Title 10, Code of Rules and Regulations, Subpart 5–1, January.

ACRONYMS AND ABBREVIATIONS:
- – = No promulgated standard or guidance value
- G = Guidance values taken from New York State Division of Water Technical and Operational Guidance Series (Ambient Water Quality Standards and Guidance Values, November 15, 1991).
- MCL = Maximum Contaminant Level
- MCLG = Maximum Contaminant Level Goal
- ND = Not detectable
- NYDOH = New York Department of Health
- NYS = New York State
- P = standard is proposed
- POC = Principal Organic Contaminant
- S = Secondary Federal Maximum Contaminant Level
- TT = Treatment Technique Action Level
- UOC = Unspecified Organic Contaminant
- ug/L = micrograms per liter
- USEPA = United States Environmental Protection Agency

See notes at end of table

Table 3-5 (cont'd)
Action Levels for Ground Water and Surface Water

106th Rescue Group
New York Air National Guard

Analyte	Ground Water				Surface Water	Reporting Limit (ug/L)
	USEPA MCL (ug/L))	USEPA MCLG (ug/L)	NYS Class GA Ground Water (ug/L)	NYDOH Drinking Water MCLs (ug/L)	NYSDEC (ug/L)	

NOTES:

1 – Compound is a Principal Organic Contaminant (POC). Under NYDOH Drinking Water Standards (10 NYCRR Subpart 5-1) a general standard of 5 ug/L applies to all POCs unless a compound-specific standard has been set.
2 – Propagation of aquatic life and wildlife.
3 – Compound is a Unspecified Organic Contaminant (UOC). Under NYDOH Drinking Water Standards (10 NYCRR Subpart 5-1) a general standard of 50 ug/L applies.
4 – NYS Ground water phenol standard of 1.0 ug/L is for total phenolic compounds.
5 – Bis(2-Ethylhexyl)phthalate is listed as diethylhexylphthalate under 6 NYCRR 700-705.
6 – Compound is a Principal Organic Contaminant (POC). Under NYSDEC Ground water Quality Standards (6 NYCRR Part 700-705), a general standard of 5 ug/L applies to all POCs unless a compound-specific standard has been set.
7 – Tainting aquatic life and wildlife.
8 – Federal MCL for arsenic is under review.
9 – Survival of aquatic life and wildlife.
10 – Dissolved arsenic form.
11 – Propagation of aquatic life and wildlife that applies to acid-soluable form.
12 – Federal MCL and MCLG for lead is concentration measured at tap.

Table 3-6
Action Levels for Soil and Sediment

106th Rescue Group
New York Air National Guard

Analyte	Saturated[1] Soil (ppm)	Unsaturated[2] Soil (ppm)	Reporting Limit (ppm)
Volatile Organic Compounds			
Benzene	0.0006	0.06	0.001
Chlorobenzene	0.017	1.7	0.001
Chloroform	0.003	0.3	0.001
1,1-Dichloroethane	0.002	0.2	0.001
1,1-Dichloroethene	0.004	0.4	0.001
1,2-Dichloroethene	0.003	0.3	0.001
Ethylbenzene	0.055	5.5	0.001
Tetrachloroethene	0.014	1.4	0.001
Toluene	0.015	1.5	0.001
1,1,1-Trichloroethane	0.0076	0.76	0.001
Trichloroethene	0.007	0.7	0.001
Xylenes	0.012	1.2	0.001
Semivolatile Organic Compounds			
Acenaphthene	0.9	50.0[3]	1
Acenaphthylene	0.41	41.0	1
Anthracene	7.00	50.0[3]	1
Benzo(a)anthracene	0.03	0.224 or RL[4]	1
Benzo(a)pyrene	0.0609 or RL[4]	0.0609 or RL[4]	1
Benzo(b)fluoranthene	0.011	1.1	1
Benzo(g,h,i)perylene	8.0	50.0[3]	1
Benzo(k)fluoranthene	0.011	1.1	1
bis(2-Ethylhexyl)phthalate	4.35	50.0[3]	1
Butyl benzyl phthalate	1.215	50.0[3]	1
2-Chloronaphthalene	NA	NA	1
2-Chlorophenol	0.008	0.8	1
4-Chloro-3-methylphenol	0.0024	0.24 or RL	1
Chrysene	0.004	0.4	1
Dibenzofuran	0.062	6.2	1
Dibenzo(a,h)anthracene	0.014 or RL[4]	0.014 or RL[4]	1
1,2-Dichlorobenzene	0.079	7.9	1
1,3-Dichlorobenzene	0.0155	1.55	1
1,4-Dichlorobenzene	0.085	8.5	1
2,4-Dichlorophenol	0.004	0.4	1

See notes at end of table

Table 3-6 (cont'd)
Action Levels for Soil and Sediment

106th Rescue Group
New York Air National Guard

Analyte	Saturated[1] Soil (ppm)	Unsaturated[2] Soil (ppm)	Reporting Limit (ppm)
Semivolatile Organic Compounds			
Diethyl phthalate	0.071	7.1	1
Dimethyl phthalate	0.02	2	1
2,4-Dimethylphenol	NA	NA	1
Di-n-butyl phthalate	0.081	8.1	1
Di-n-octyl phthalate	1.2	50.0[3]	1
2,4-Dinitrophenol	0.002	0.2 or RL	1
2,4-Dinitrotoluene	NA	NA	1
2,6-Dinitrotoluene	0.01	1.0	1
4,6-Dinitro-2-methylphenol	NA	NA	1
Fluoranthene	19	50.0[3]	1
Fluorene	3.5	50.0[3]	1
Hexachlorobenzene	0.014	0.41[4]	1
Hexachlorobutadiene	NA	NA	1
Hexachlorocyclopentadiene	NA	NA	1
Hexachloroethane	NA	NA	1
Indeno(1,2,3-cd)pyrene	0.032	3.2	1
Isophorone	NA	NA	1
2-Methylnaphthalene	0.364	36.4	1
2-Methylphenol	0.001	0.1 or RL	1
4-Methylphenol	0.009	0.9	1
Naphthalene	0.13	13.0	1
Nitrobenzene	0.002	0.2 or RL	1
2-Nitrophenol	0.0033	0.33 or RL	1
4-Nitrophenol	0.001	0.1 or RL	1
2,2'-oxybis(1-chloropropane)	NA	NA	1
Pentachlorophenol	0.01	1 or RL	1
Phenanthrene	2.20	50.0[3]	1
Phenol	0.0003	0.03 or RL	1
Pyrene	6.65	50.0[3]	1
1,2,4-Trichlorobenzene	NA	NA	1
2,4,5-Trichlorophenol	0.001	0.1	1
2,4,6-Trichlorophenol	NA	NA	1

See notes at end of table

Table 3–6 (cont'd)
Action Levels for Soil and Sediment

106th Rescue Group
New York Air National Guard

Analyte	Saturated[1] Soil (ppm)	Unsaturated[2] Soil (ppm)	Reporting Limit (ppm)
Inorganic Constituents			
Arsenic	7.5 or SB	7.5 or SB	0.20
Barium	300 or SB	300 or SB	0.20
Cadmium	1 or SB	1 or SB	0.20
Chromium	10 or SB	10 or SB	0.20
Lead	SB[5]	SB[5]	0.20
Selenium	2 or SB	2 or SB	0.20
Silver	SB	SB	0.20

Notes:

Action Levels are shaded.

NYDEC, 1994. Division Technical and Administrative Guidance Memorandum,
Determination of Soil Cleanup Objectives and Cleanup Levels;
Division of Hazardous Waste Remediation; January.

NA – Not available
ppm – parts per million
RL – Reporting Limit
SB – Site Background
TAGM – Technical and Administrative Guidance Memorandum
1 – Soil in direct contact with ground water.
2 – Greater than five feet from the water table.
3 – Per the Technical and Administrative Guidance Memorandum, the action level of an individual semivolatile organic compound is limited to less than or equal to 50 ppm.
4 – Recommendation from USEPA Health Board.
5 – Background levels for lead vary widely. Average levels in undeveloped, rural areas may range from 4–61 ppm. Average background levels in metropolitan or suburban areas or near highways are much higher and typically range from 200–500 ppm.

Soil cleanup objectives are developed for soil with an organic carbon content of 1%

personal computer in the field, compiled and stored in a database, and then linked with a drafting program to assist with interpretation.

Sample tracking and integrity are the first step in the process. The sample tracking system uses bar codes attached to each sample bottle. Quality assurance reporting includes producing and recording chain-of-custody and analytical request forms, preparing container requirements and costs, and maintaining overall data quality objectives.

Data generated in the field will be available to the project team on a real-time basis for decision making. The analytical data from the on-site analytical laboratory are generated using existing software that produces text-formatted output from each GC run. These data are then converted to database-formatted files using ABB-ES-developed software. This reformatting allows for initial editing and evaluation of the data. This conversion will be completed on each day's output of data and produces what is termed "preliminary" (unevaluated) data. At the completion of each day, all field data including raw data, copies of pertinent logbook pages, raw data, and calculations will be sent via electronic transfer, fax, or overnight mail to the project chemist for formal evaluation.

Once the data has been reviewed and qualified by the project chemist, it will be transmitted back to the project team as interim data -- generally within 24 hours of receipt from the field -- and appended to the primary analytical database by field operators. The database is constructed to allow querying of the database and production of crosstab reports. The menu of reports is designed to check the accuracy and quality of the database. The quality control/quality assurance at this stage is essential to produce usable data. The analytical results from this process are considered "interim" data. The interim data will be used for interpretive purposes and will be available for use by other approved personnel. All analytical data presented will include the following disclaimer:

"This data has not been finalized and is not intended for distribution or final interpretation. Only data presented in the final Site Investigation report should be considered Final Data."

Following evaluation, the analytical data are imported into another database that is linked with a drafting program. This program links the analytical data with the nonanalytical data such as facility drawings, survey information, and geotechnical data. Using predetermined coding, the drafting program requests a summary of analytical values and matches the data with sample locations. These data will then be used for contouring the contaminant concentrations and presented as graphical figures. The data can also be imported into list boxes used to indicate concentrations at a specific location. Brief narratives will provide notes in the comment fields. Color maps will be generated to assist with the interpretation of site conditions. Data will be final when the report tables have been generated, reviewed for transcription errors, etc., and reprinted.

The data management program proposed for the SI is intended to provide an efficient and cost effective method for production and interpretation of data as it is obtained in the field. These data will be used to direct the field operation as it is occurring. The data management program will contain standard procedures to ensure the consistency and validity of the data generated and interpreted. These procedures will include processing and evaluating the data, providing backup of the data, and insuring the integrity of the data produced by the databases. The software written for the management and interpretation of data will be verified for accuracy. The project chemist and technical lead or their representatives will manipulate raw data from the first input package. This manually processed data will be compared to the software-generated interim data of the sample input package. The comparison of data will provide a verification to ensure that the software is working correctly.

3.7 SITE-SPECIFIC CONCEPTUAL MODELS AND SAMPLING STRATEGIES

This section provides an overview of the site-specific conceptual models and sampling strategies that have been developed for each of the nine sites under investigation.

3.7.1 Site 1 - Aviation Gasoline Spill Site

3.7.1.1 Background

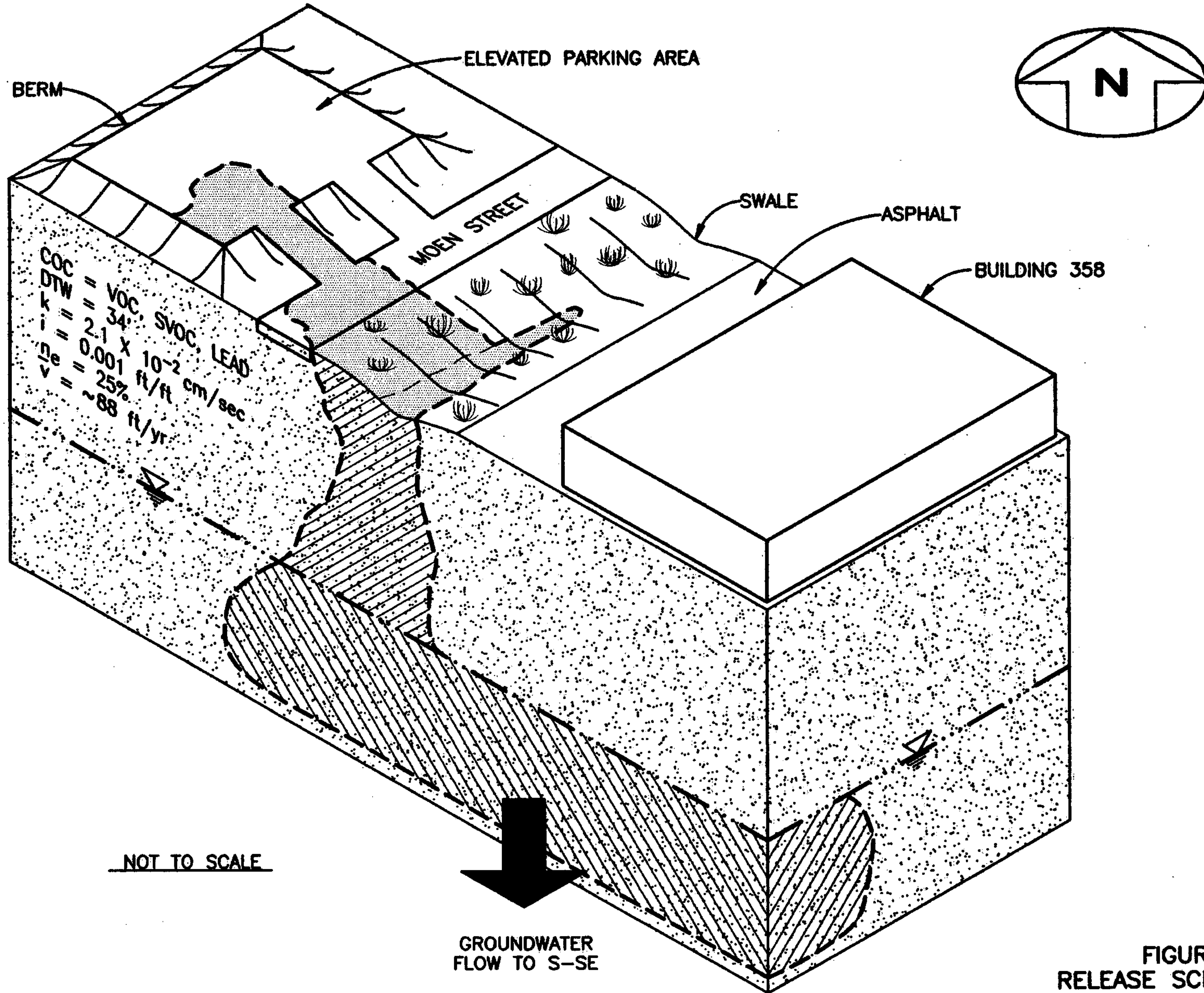
Site 1 is located northeast of Smith Avenue on both sides of Moen Street. In 1965, a tanker parked in an elevated parking lot northwest of Moen Street released a maximum of 5,000 gallons of aviation gasoline. It is believed that this release took place in a short time frame (overnight). The fuel accumulated in a drainage swale where it evaporated or infiltrated into the subsurface; none of the fuel was recovered. This scenario is illustrated in Figure 3-1.

3.7.1.2 Constituents

Constituents of concern in aviation gasoline are lead and VOCs such as benzene, toluene, ethylbenzene, and xylenes.

3.7.1.3 Hydrogeologic Conditions

Depth to ground water at this site is expected to be approximately 34 feet bgs. This assumption is based on measurements of water levels in nearby piezometers. Soils encountered during installation of the nearest piezometer consisted of medium-grained sand with a trace of gravel.



DATE OF RELEASE = 1965
VOLUME OF RELEASE $\simeq$ 5000 GALLONS (MAXIMUM)

FIGURE 3-1
RELEASE SCENARIO
SITE 1 – AVIATION GASOLINE SPILL SITE
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

3.7.1.4 Migration/Release Pathway

The aviation gasoline accumulated in the drainage swale until it had infiltrated into the subsurface or evaporated. The distance the fuel traveled in the drainage swale and the final discharge point are not known. Figures included in the SAP indicate that the length of the affected swale is approximately 240 feet. Because of the period of time that the fuel remained in the swale and the volume of the release, free-phase product may have moved downward until it reached the water table and then migrated in the direction of ground-water movement.

3.7.1.5 Affected Media

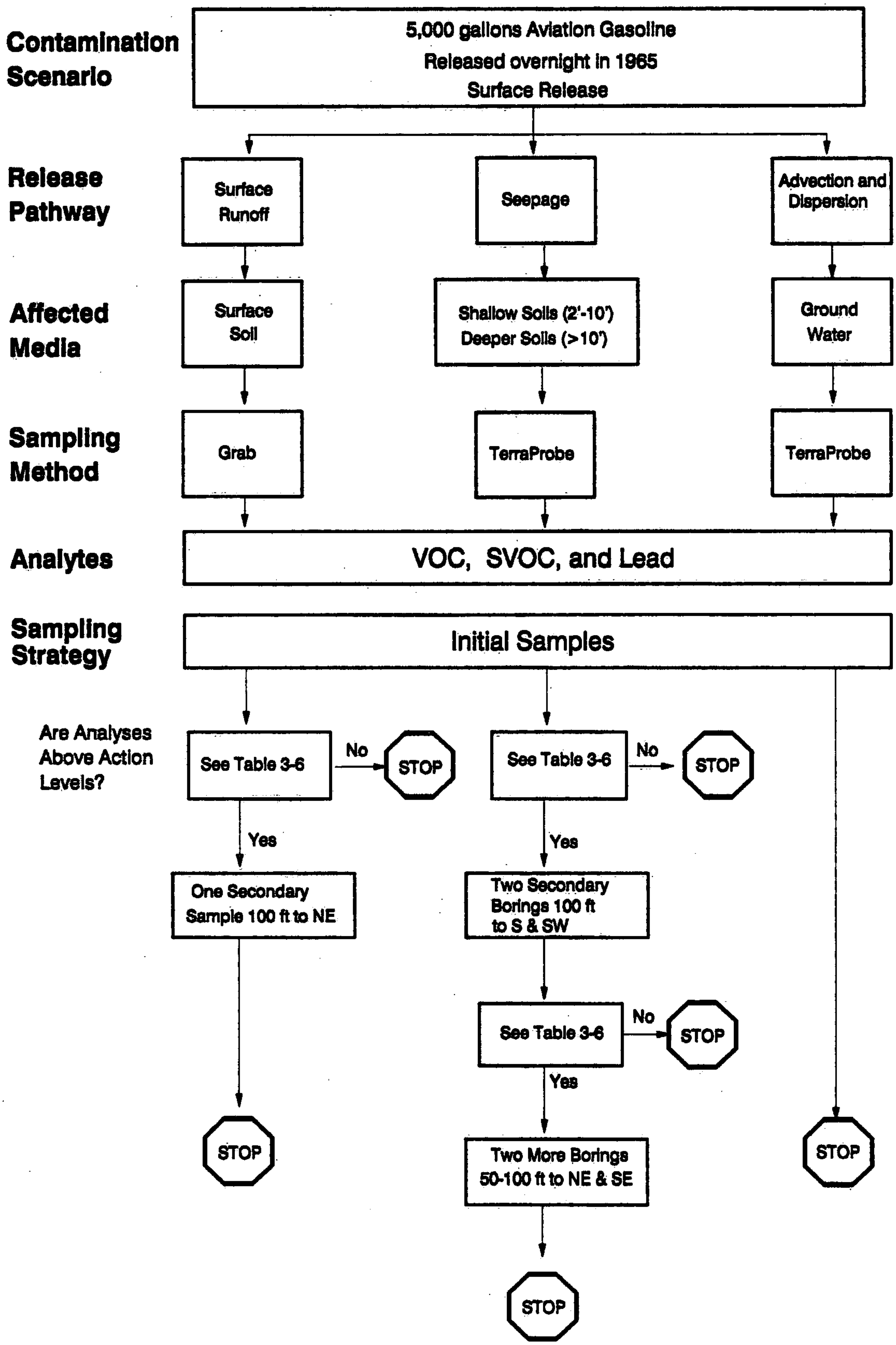
Media potentially affected by the release would be soils directly beneath the spilled fuel, soils in contact with any fuel "floating" on the water table, and ground water in contact with any floating fuel or contaminated soils. Because of the period of time since the release (almost 30 years), free-phase product is not expected; however, the extent of dissolved constituents may be large.

3.7.1.6 Sampling Strategy

As shown on the sampling logic diagram (Figure 3-2), the pathways of potential release were surface runoff, seepage through soils in the unsaturated zone, and through advection and dispersion in the ground water. Affected media may include surface soils in the swale, shallow and deeper subsurface soils in the unsaturated and saturated zones, and shallow ground water.

Sample points will be marked or staked at this site as indicated on Figure 3-3 prior to sampling operations. Both initial and secondary sample locations are shown in this figure.

Figure 3-2 Sampling Logic Diagram
Site 1 - Aviation Gasoline Spill Site
106th Rescue Group
New York Air National Guard



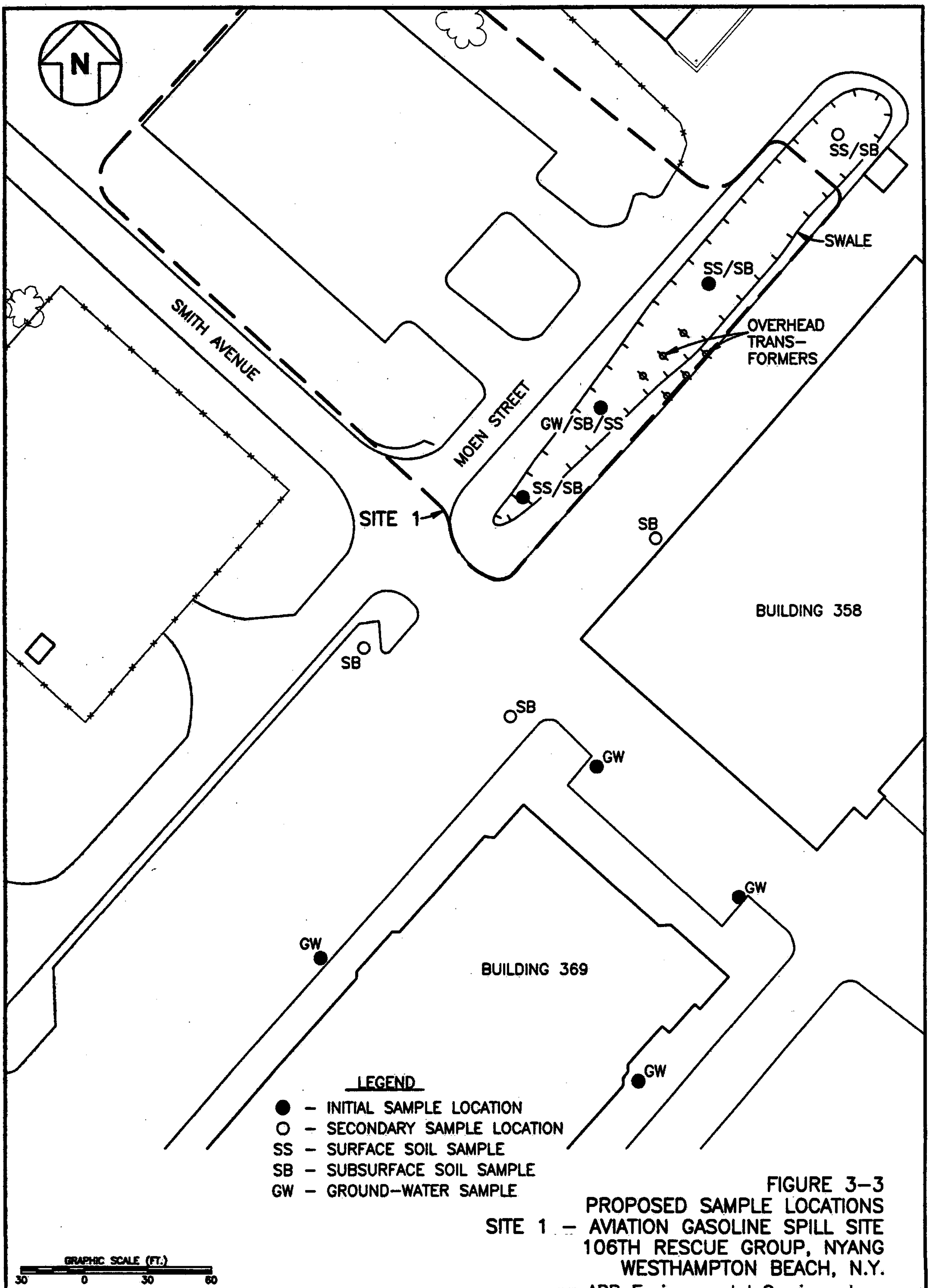


FIGURE 3-3
PROPOSED SAMPLE LOCATIONS
SITE 1 – AVIATION GASOLINE SPILL SITE
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

Three initial surface-soil samples will be collected from the swale: one will be collected from the lowest point in the swale where accumulation of the aviation gasoline spill was likely to have been the greatest, and two will be collected 50 feet to either side of this sample. If analyses of the initial surface-soil samples indicate that concentrations of constituents typically associated with aviation gasoline are present above action levels, then one secondary surface-soil sample will be collected in the swale 100 feet northeast of the contaminated area. Three to four surface-soil samples will be collected from the swale.

Subsurface soil samples will be collected from each of the three initial surface-soil sample locations in the swale. Subsurface soils will be collected from 8 to 10 feet (shallow soil), 20 to 22 feet, 30 to 32 feet (deeper soils), and 38 to 40 feet (saturated soil) bgs using a TerraProbe. If contaminants are detected above action levels in the soil samples from the intervals at 20 or 30 feet, samples collected from the saturated zone (approximately 38 to 40 feet bgs) will be analyzed. If constituents are detected above action levels in samples from any depth at the initial locations, then secondary borings will be advanced at two more locations. These secondary sample points will be approximately 100 feet south and southwest of the swale. Samples will be collected at the same depth intervals as in the initial borings. If constituents are detected above action levels at one or both of these two secondary locations, then two more borings will be advanced at points 50 to 100 feet from the contaminated area in the northeast and southeast directions. No further sampling will be conducted during this SI for Site 1. Nine to 28 subsurface soil samples will be collected and analyzed from Site 1.

Ground-water samples will be collected at five locations from the upper portion of the saturated zone. The first location will be at the middle boring in the swale; the second location will be 100 to 150 feet downgradient (south) of the sample location in the swale. The remaining three sample locations will be approximately 100 to 150 feet south, southeast, and southwest of the second location. No further sampling of ground water will be conducted during the SI for Site 1. Five ground-water samples will be collected from Site 1.

A minimum of 17 and a maximum of 37 media samples will be collected and analyzed at Site 1. The samples will be analyzed for VOCs, SVOCs, and lead in the on-site analytical laboratory.

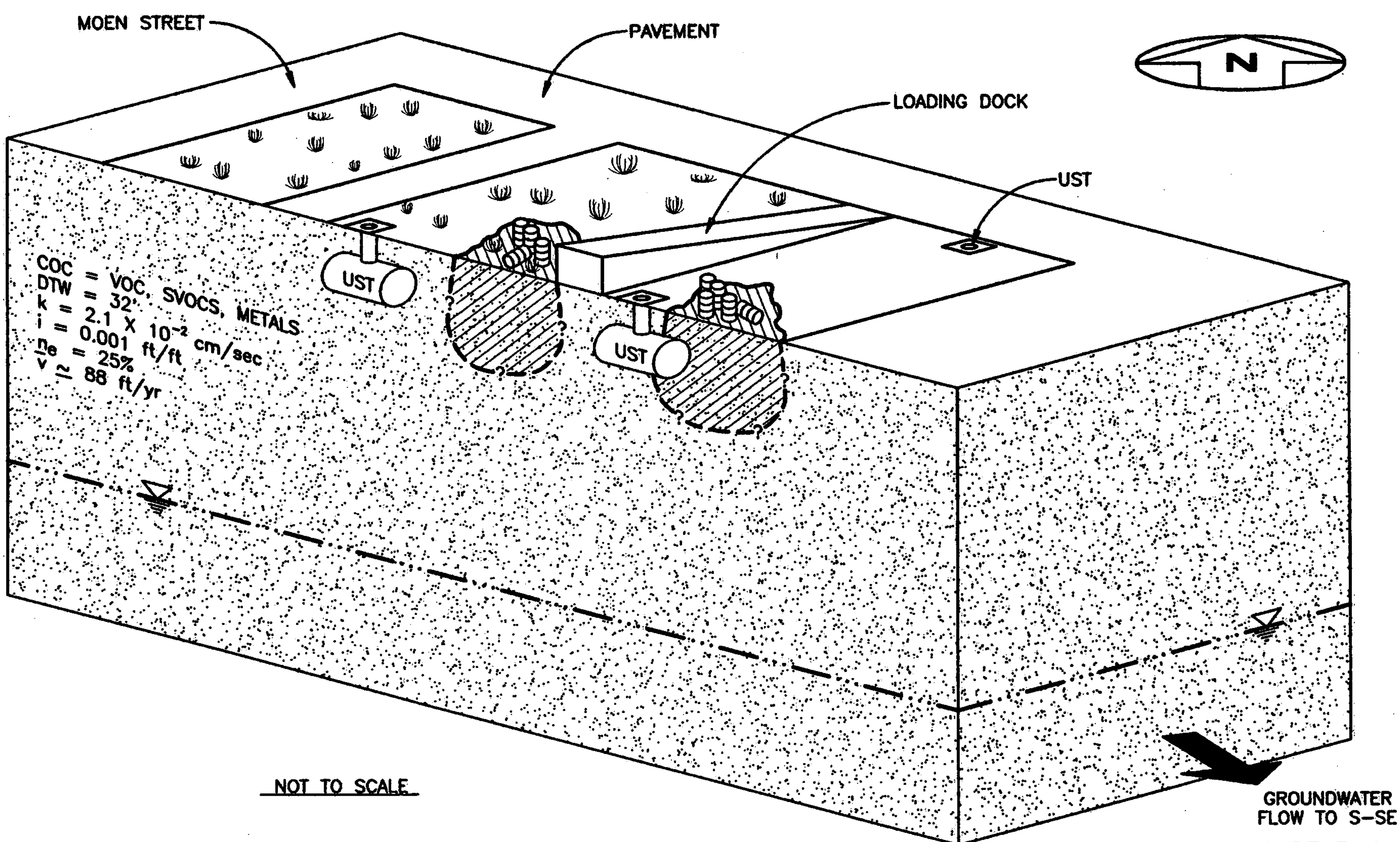
3.7.2 Site 2 - Former Hazardous Waste Storage Area

3.7.2.1 Background

Site 2 is located adjacent to the northeast wall of Building 358. The area's surface is mostly grass; however, part of the area is covered with asphalt and concrete. The site was used as a storage area for shop wastes and recovered fuels and oils from 1970 until 1984. The storage area did not have secondary containment. Although spills have not been reported at this site, a previous site-visit report indicated that surface soil staining was observed. The conceptual model assumes that this staining was localized. The records-search report estimated that less than 500 gallons of fluids would have been released at this site by minor spills (Figure 3-4). Underground storage tanks (USTs) are located at this site. Potential contamination associated with the USTs will not be addressed by this program.

3.7.2.2 Constituents

Shop wastes may have included solvents, fuels, and oils. These substances may contain a variety of VOCs, SVOCs, and metals.



DATE(S) OF POTENTIAL RELEASE(S) = 1970 TO 1984
VOLUME OF POTENTIAL RELEASE(S) = <500 GALLONS

FIGURE 3-4
RELEASE SCENARIO
SITE 2 – FORMER
HAZARDOUS WASTE STORAGE AREA
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

3.7.2.3 Hydrogeologic Conditions

Depth to ground water is expected to be approximately 32 feet bgs at this site. This assumption is based on measurements taken from nearby piezometers. Soils encountered during installation of the piezometers consisted of medium-grained sand with a trace of gravel.

3.7.2.4 Migration/Release Pathway

Solvents, fuel, and oil released from the storage area may have been released to surface soils and migrated downward into the subsurface soils. Because of the small amount of liquids estimated to have been released at this site, the conceptual model assumes that the potential contaminants have not reached the ground water.

3.7.2.5 Affected Media

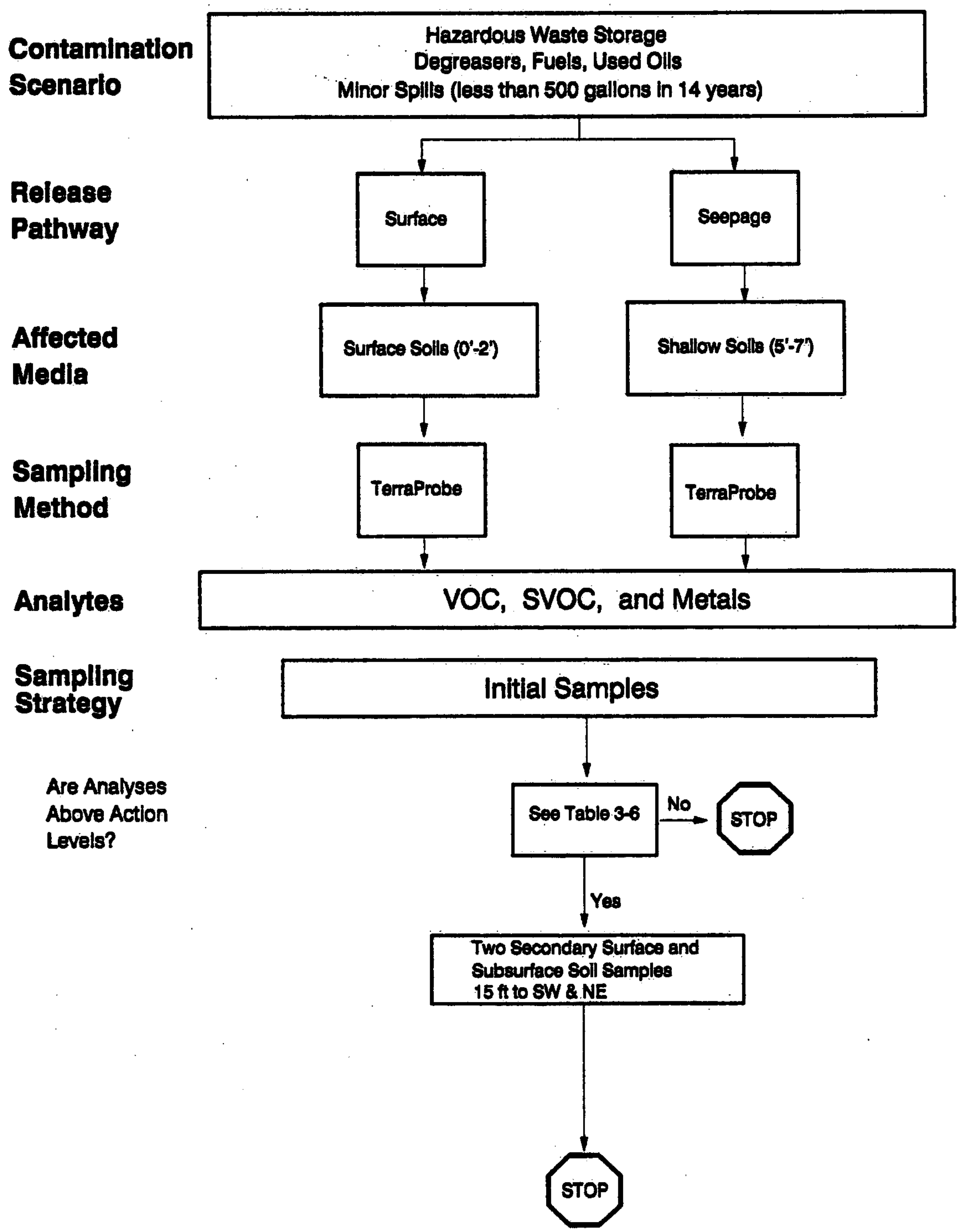
Media affected by the release would be surface and shallow subsurface soils directly beneath the potential release. Contaminants are not expected in deeper subsurface soils or in the ground water as a result of releases from this site.

3.7.2.6 Sampling Strategy

As shown on the sampling logic diagram (Figure 3-5), the potential release pathways were surface runoff and seepage through soils in the unsaturated zone. Affected media may include surface soils and shallow subsurface soils within the unpaved area at the site.

Sample points will be marked or staked as indicated on Figure 3-6 prior to sampling operations. Both initial and secondary sample locations are shown in this figure.

Figure 3-5 Sampling Logic Diagram
Site 2 - Former Hazardous Waste Storage Area
106th Rescue Group
New York Air National Guard



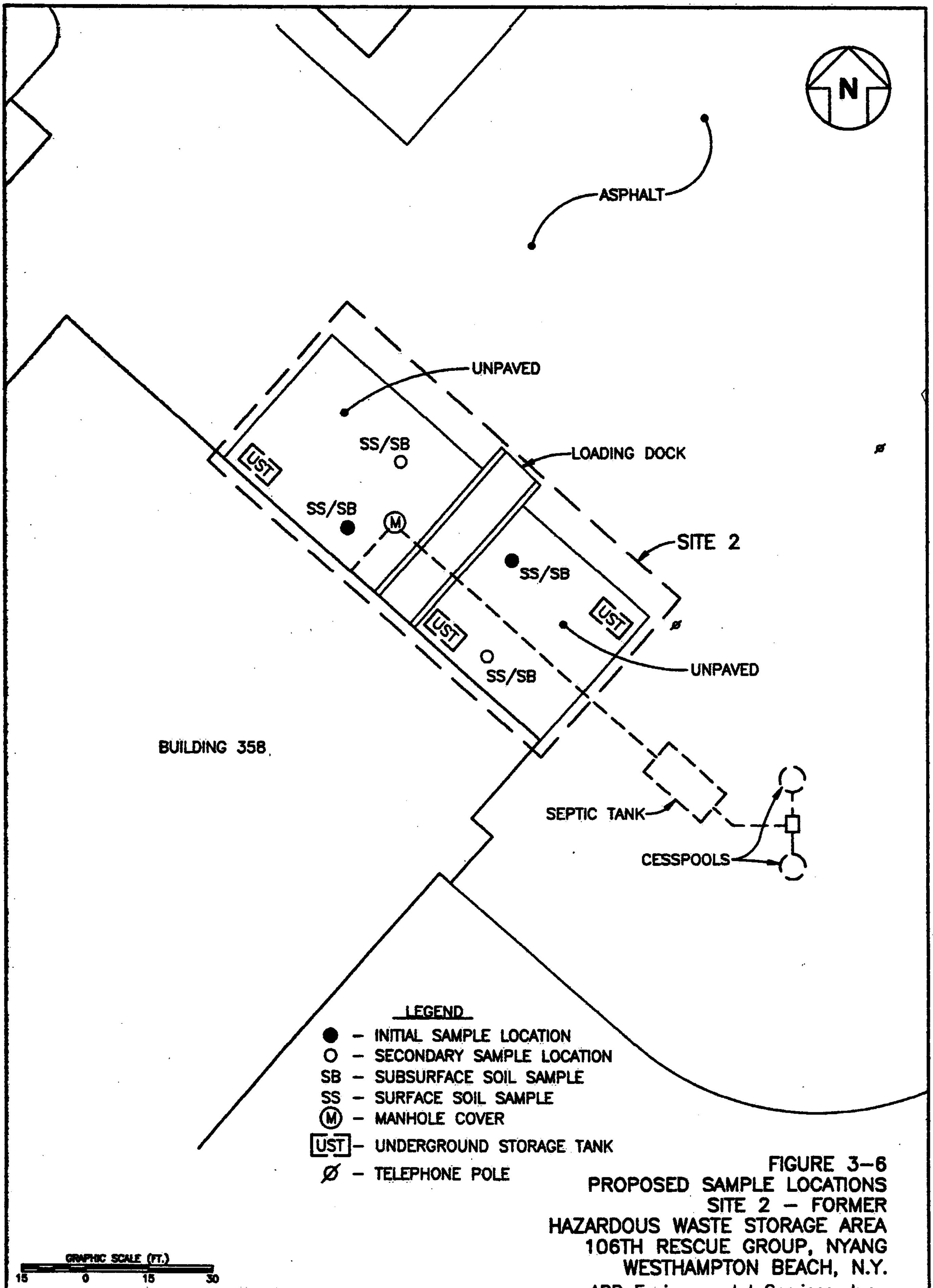


FIGURE 3–6
PROPOSED SAMPLE LOCATIONS
SITE 2 – FORMER
HAZARDOUS WASTE STORAGE AREA
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

Two surface soil samples, one on each side of the loading dock at Site 2, will be collected from locations where surface stains and/or stressed vegetation appear to be greatest. Shallow subsurface soil samples will also be collected from 5 to 7 feet bgs with a TerraProbe at both of the initial sampling locations. If analyses of the initial soil samples detect concentrations of constituents above action levels, two secondary surface soil samples and two secondary soil samples from 5 to 7 feet bgs will be collected at points 15 feet away from the initial sample locations. No further sampling will be conducted during this SI for Site 2. Two to four surface and two to four shallow subsurface soil samples will be collected from Site 2.

A minimum of four and a maximum of eight media samples will be collected at Site 2. The samples will be analyzed for VOCs, SVOCs, and metals in the on-site analytical laboratory.

3.7.3 Site 3 - Former Hazardous Waste Storage Area (1984-1989)

This site was identified in the records search and SAP as the "Current Hazardous Waste Storage Area"; however, the site is no longer in use. This Addendum uses the name assigned by the Management Action Plan (MAP).

3.7.3.1 Background

Site 3 is located in a paved parking lot in a gravel area which used to be the floor of Building 282. The site was used from 1984 to 1989 as a storage area for shop wastes, recovered oils, and waste fuels. Drums were placed on the gravel floor of the former building; the storage area did not have secondary containment. Although spills have not been reported at this site, a previous records-search report indicated that discolored gravel and soil were observed. The conceptual model assumes that the observed contamination was small and localized. The records search estimated that the cumulative volume of any potential releases would be less than 1,000 gallons and that any releases would have been from minor spills (Figure 3-7).

3.7.3.2 Constituents

It has been reported that the shop wastes included solvents; petroleum, oil and lubricant (POL) products; and stripper solvents. These substances may have included VOCs, SVOCs, and metals.

3.7.3.3 Hydrogeologic Conditions

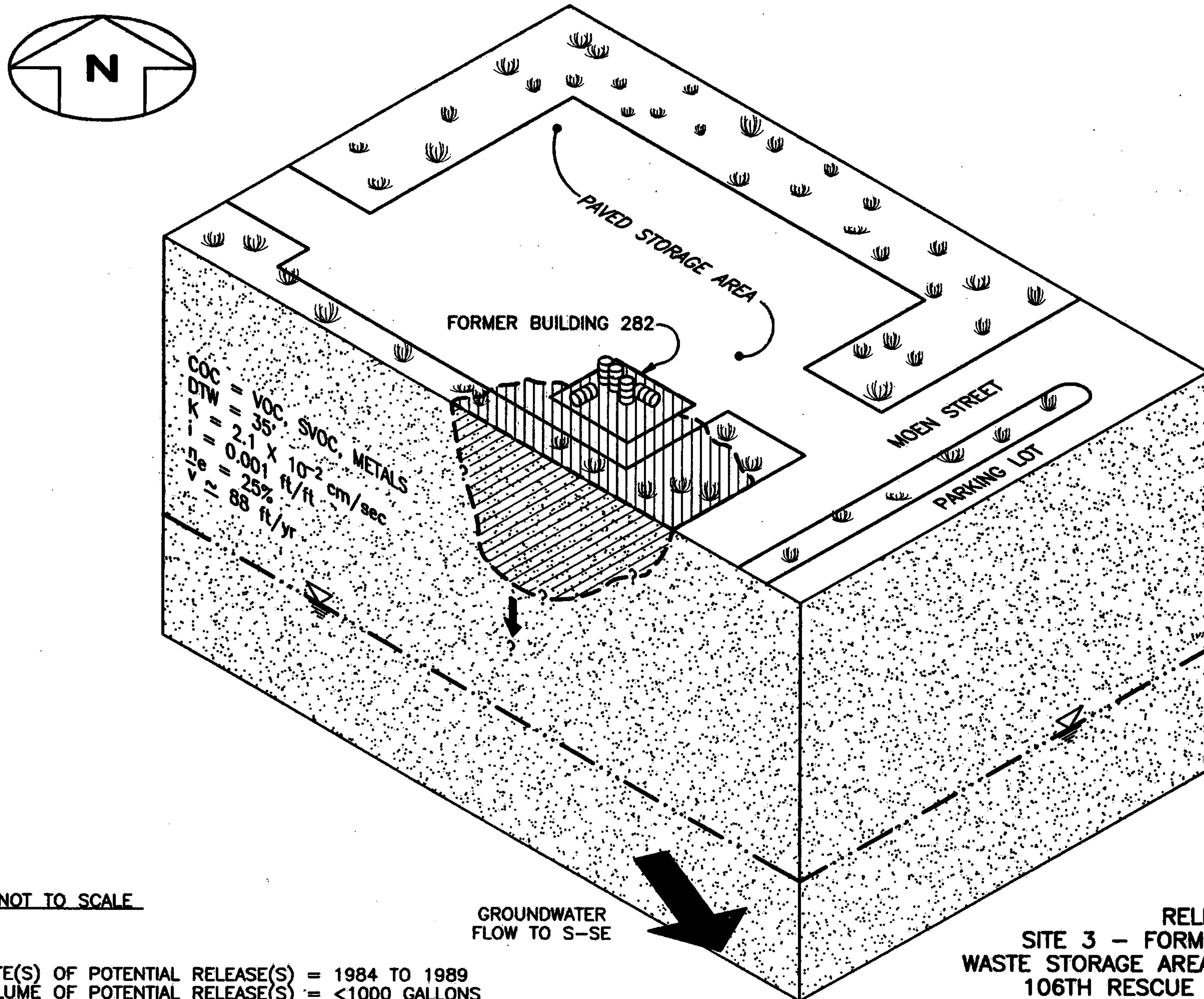
Depth to ground water at Site 3 is expected to be approximately 35 feet bgs. This assumption is based on measurements taken from nearby piezometers. Soils encountered during installation of the piezometers consisted of medium-grained sand with a trace of gravel.

3.7.3.4 Migration/Release Pathway

Solvents, fuel, and oil released from the storage area may have been released to the surface soils and migrated downward into subsurface soils. Because of the small amount of liquids estimated to have been released at this site during the five years of operation, the potential contaminants are not expected to have reached the ground water.

3.7.3.5 Affected Media

Media affected by the release would be surface or shallow subsurface soils near the potential release.



NOT TO SCALE

DATE(S) OF POTENTIAL RELEASE(S) = 1984 TO 1989
VOLUME OF POTENTIAL RELEASE(S) = <1000 GALLONS

FIGURE 3-7
RELEASE SCENARIO
SITE 3 - FORMER HAZARDOUS
WASTE STORAGE AREA (1984-1989)
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

3.7.3.6 Sampling Strategy

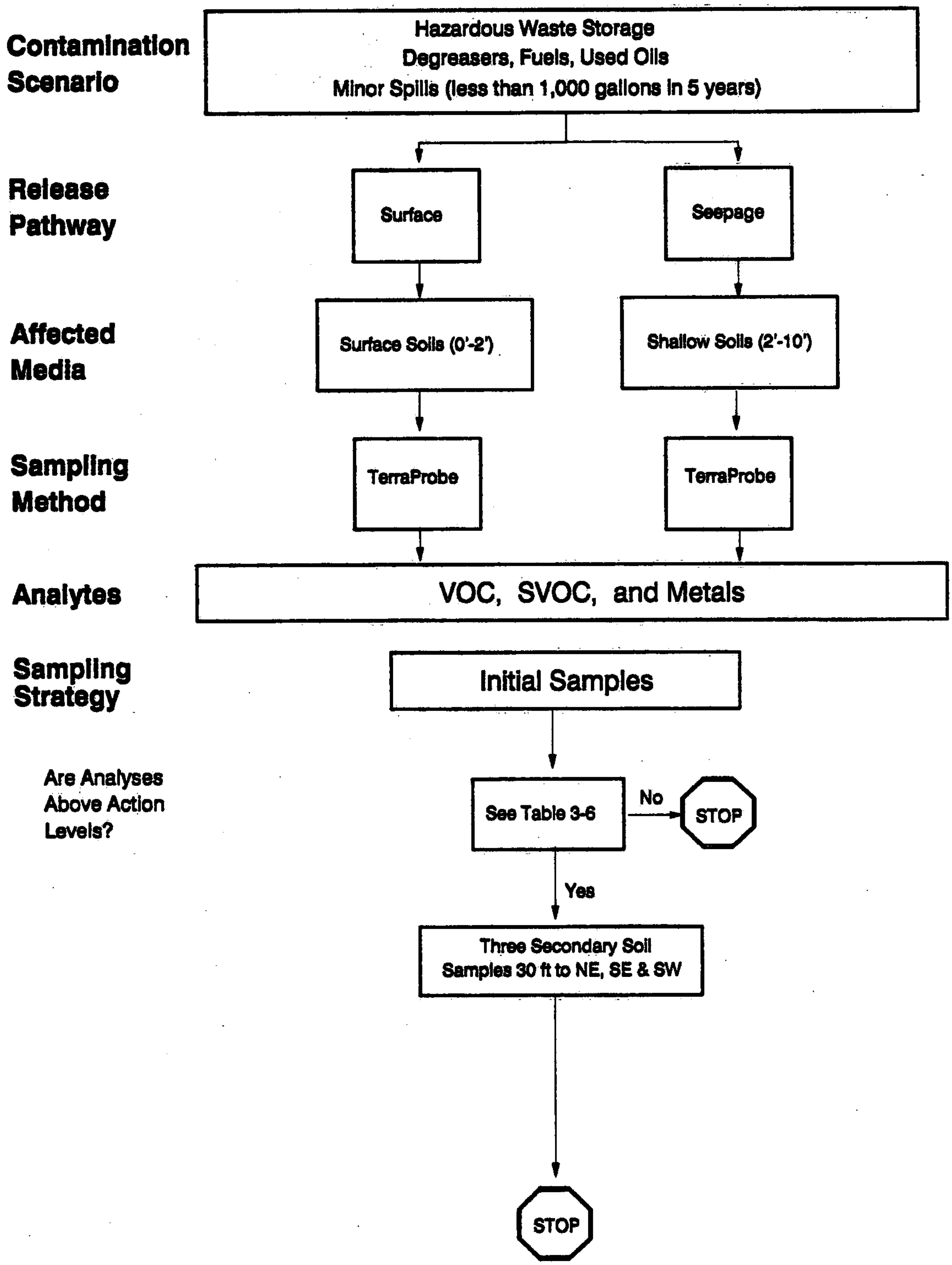
As shown on the sampling logic diagram (Figure 3-8), the potential release pathways were surface runoff and seepage through soils in the unsaturated zone. Affected media may include surface soils and shallow subsurface soils.

Sample points will be marked or staked as indicated on Figure 3-9 prior to sampling operations. Both initial and secondary sample locations are shown in this figure.

Two surface soil samples, one in the area of former Building 282 and one 15 feet south of this location at the edge of the paved parking area, will be collected where indications of stains or surface runoff are present. Three secondary surface soil samples will be collected at points 30 feet northeast, southeast, and southwest of the sample located at the edge of the paved area if analysis of either surface soil sample indicates the presence of constituents above action levels. No additional surface soils will be collected during this SI for Site 3. Two to five surface soil samples will be collected from Site 3.

Shallow subsurface soil samples will be collected from 5 to 7 feet bgs and 15 to 17 feet bgs with a TerraProbe at both of the initial surface soil sample locations. Shallow subsurface soil samples will also be collected from these depth intervals at the secondary surface soil sample locations if these sample locations are necessary. If constituents are detected above action levels in soils from the 5- to 7-foot depth interval, the soil samples collected from the 15- to 17-foot depth interval will be analyzed. No additional subsurface soil samples will be collected beyond the secondary locations or beyond the 15- to 17-foot depth interval. Two to 10 subsurface soil samples will be collected from Site 3.

Figure 3-8 Sampling Logic Diagram
Site 3 - Former Hazardous Waste Storage Area (1984-1989)
106th Rescue Group
New York Air National Guard



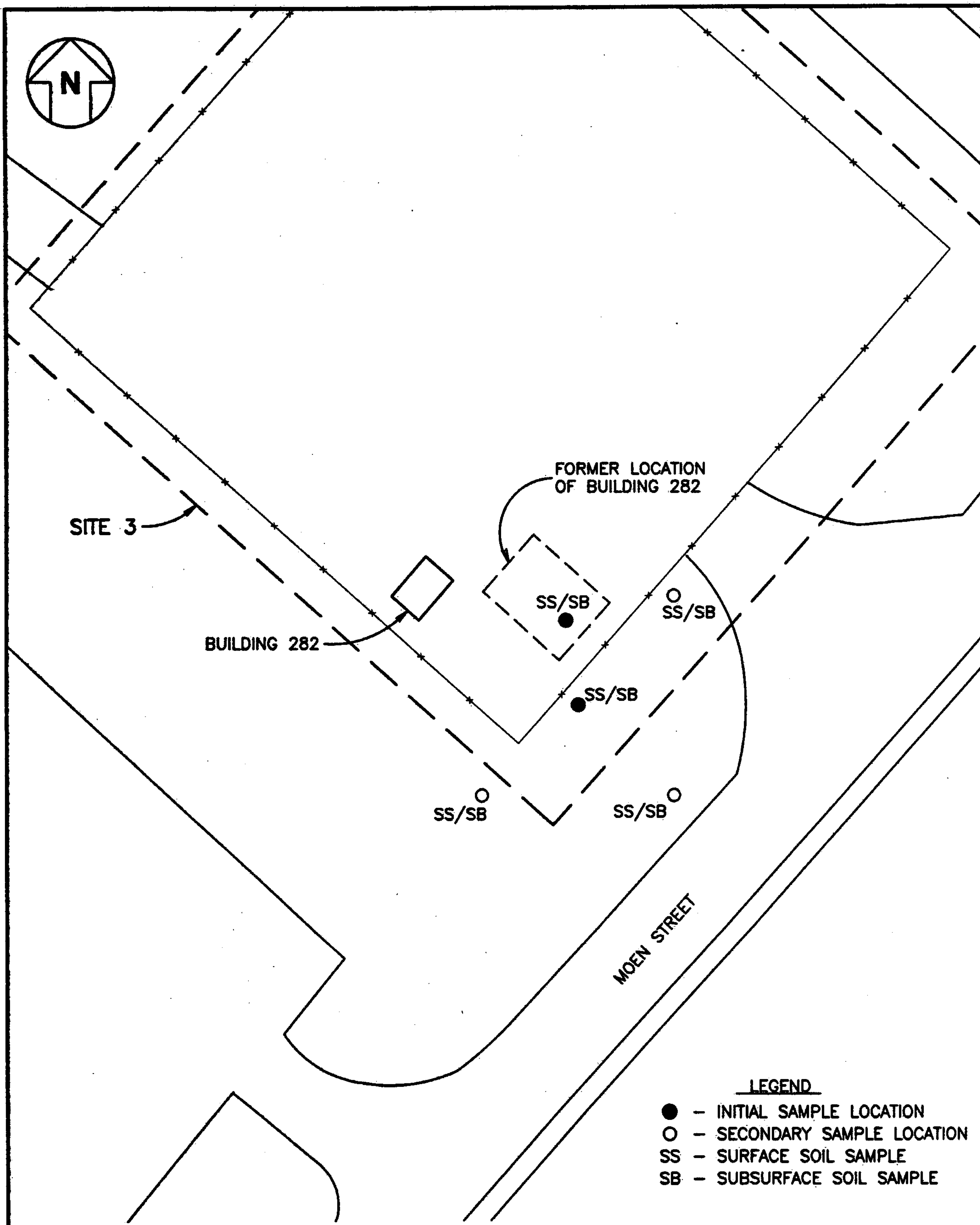


FIGURE 3–9
PROPOSED SAMPLE LOCATIONS
SITE 3 – FORMER HAZARDOUS
WASTE STORAGE AREA, (1984–1989)
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

A minimum of four and a maximum of 15 media samples will be collected at Site 3. The samples will be analyzed for VOCs, SVOCs, and metals in the on-site analytical laboratory.

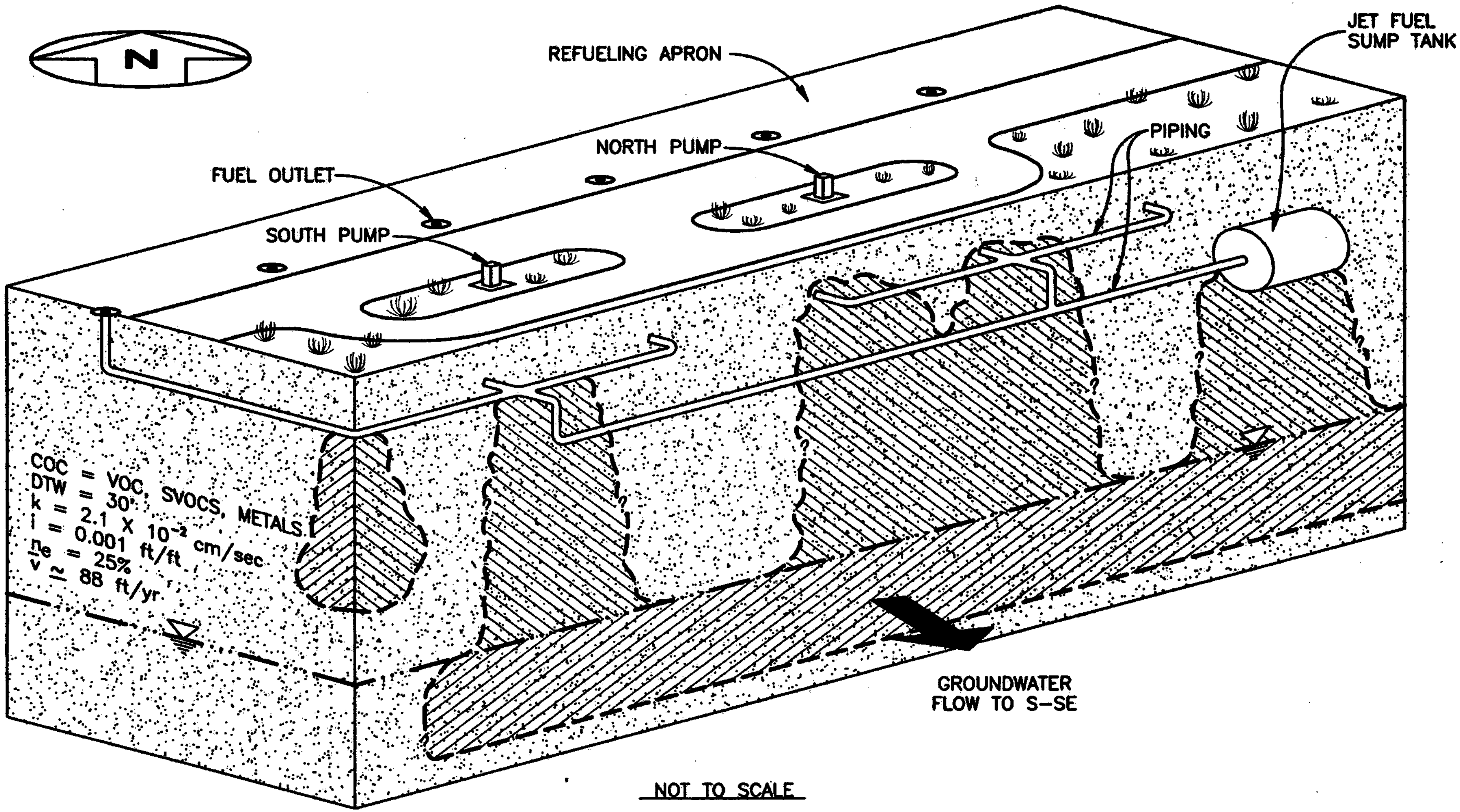
3.7.4 Site 4 - Aircraft Refueling Apron Spill Site

3.7.4.1 Background

Site 4 encompasses the grassy areas adjacent to the refueling apron southeast of Building 358. The refueling apron was used from the 1950s through the 1980s. Fuel was pumped from the POL Tank Farm, located approximately 3,000 feet southeast of the refueling apron, to fuel outlets in a depressed concrete area within the refueling apron. The depressed area was built to keep surface releases from migrating onto the grassy area. Unused fuel was pumped back to the POL Tank Farm. The records-search report listed known spills of hydraulic oil (50 gallons/year), trichloroethene (30 gallons/year), and routine fuel drippings. Most spills probably drained to catch basins along the edge of the apron and were directed to the outfall at Site 9. As reported in the SAP, a recent leak detection study indicated that a potential for leaks exists in the fuel lines near the northern distribution pump. This scenerio is illustrated in Figure 3-10. A preliminary soil-gas survey conducted by ABB-ES in 1991 also indicated that VOCs are present in the soil near the north pump. The amount of fuel lost has not been determined.

3.7.4.2 Constituents

The primary contaminant at Site 4 is aviation fuel with minor amounts of solvents and oils; however, the solvent and oil spills would have likely been received as outfall to Site 9. Constituents of concern at Site 4 are VOCs, SVOCs, and lead.



DATE(S) OF POTENTIAL RELEASE(S) = 1950'S TO 1980'S
VOLUME OF POTENTIAL RELEASE(S) = UNKNOWN

FIGURE 3-10
RELEASE SCENARIO
SITE 4 - AIRCRAFT
REFUELING SPILL SITE
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

3.7.4.3 Hydrogeologic Conditions

Depth to ground water at this site is expected to be approximately 27 feet bgs. This assumption is based on measurements taken from nearby piezometers. Soils encountered during installation of the piezometers consisted of medium-sized sand with a trace of gravel.

3.7.4.4 Migration/Release Pathway

Fuel released from tanks, fuel lines, or pumps would have migrated downward until it reached the water table and then migrated in the direction of ground-water movement. Because fuels may have been released and the amounts released are unknown, the conceptual model assumes that ground water and soil beneath the grassy areas adjacent to the refueling apron may be contaminated.

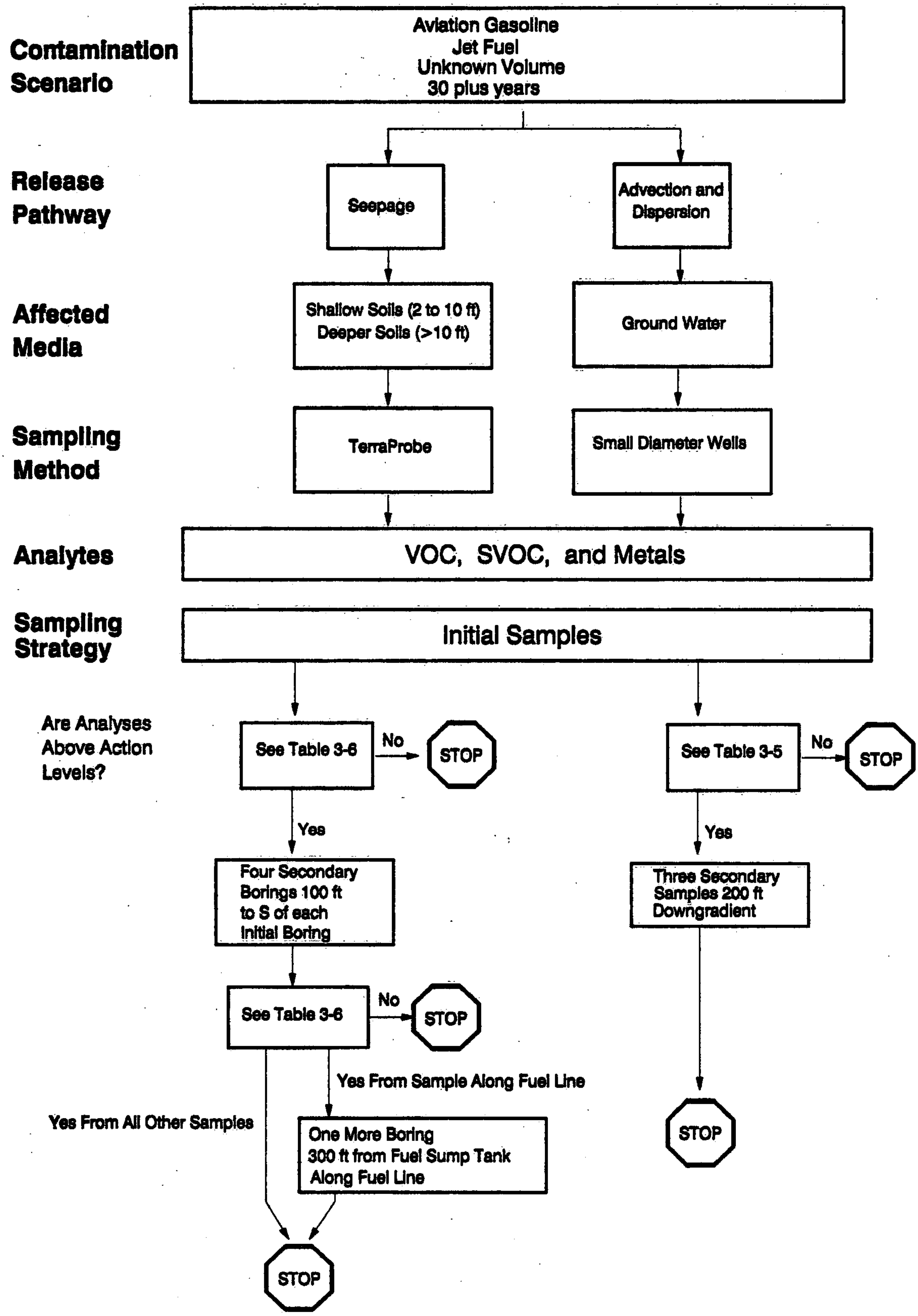
3.7.4.5 Affected Media

Media affected by the release would be shallow and deeper subsurface soils beneath the leaking lines, tanks, or pumps, soils in contact with the fuel on the water table, and shallow ground water in contact with subsurface fuel and contaminated soils.

3.7.4.6 Sampling Strategy

As shown on the sampling logic diagram (Figure 3-11), the potential release pathways were seepage through soils in the unsaturated zone and possibly through advection and dispersion in the ground water. Affected media may include shallow and deeper subsurface soils in the unsaturated and saturated zones and shallow ground water.

Figure 3-11 Sampling Logic Diagram
Site 4 - Aircraft Refueling Apron
106th Rescue Group
New York Air National Guard



Sample points will be marked or staked at this site as indicated on Figure 3-12 prior to sampling operations. Both initial and secondary sample locations are shown in this figure.

Initial subsurface soil samples will be collected by advancing four borings with a TerraProbe. One boring will be located a few feet south of each of the distribution pumps, the jet fuel sump tank, and one will be located approximately 200 feet southeast of the north distribution pump adjacent to the storm sewer pipeline that discharges to Site 9. Subsurface soils will be collected from 5 to 7 feet bgs (shallow soils), 15 to 17 feet bgs, 25 to 27 feet bgs, and 38 to 40 bgs (deeper soils). If constituents are detected above action levels in any of these soil samples, one secondary boring will be located approximately 100 feet south-southeast of each initial boring where constituents were detected above action levels (i.e., up to four secondary borings). If constituents are detected above action levels in the secondary boring along the fuel line, a final boring will be positioned approximately 300 feet south of the jet fuel sump tank along this buried fuel line. Samples will be collected from the same depth intervals in these borings as were collected from the initial borings. No further sampling of subsurface soils will be performed during this SI for Site 4. Sixteen to 36 subsurface soil samples will be collected from Site 4.

Ground-water samples will be collected from the upper portion of the saturated zone at the initial boring locations southeast of the two fuel distribution pumps and the jet fuel sump tank. As many as three secondary ground-water samples will be collected from the aquifer if the initial samples contain constituents above action levels. The secondary ground-water samples will be collected from boring locations positioned approximately 200 feet downgradient of the initial locations. No ground-water sampling beyond the secondary locations will be performed at Site 4 during this SI. As many as three small-diameter wells may be installed with the CPT rig in association with the ground-water sampling. These locations will coincide with three of

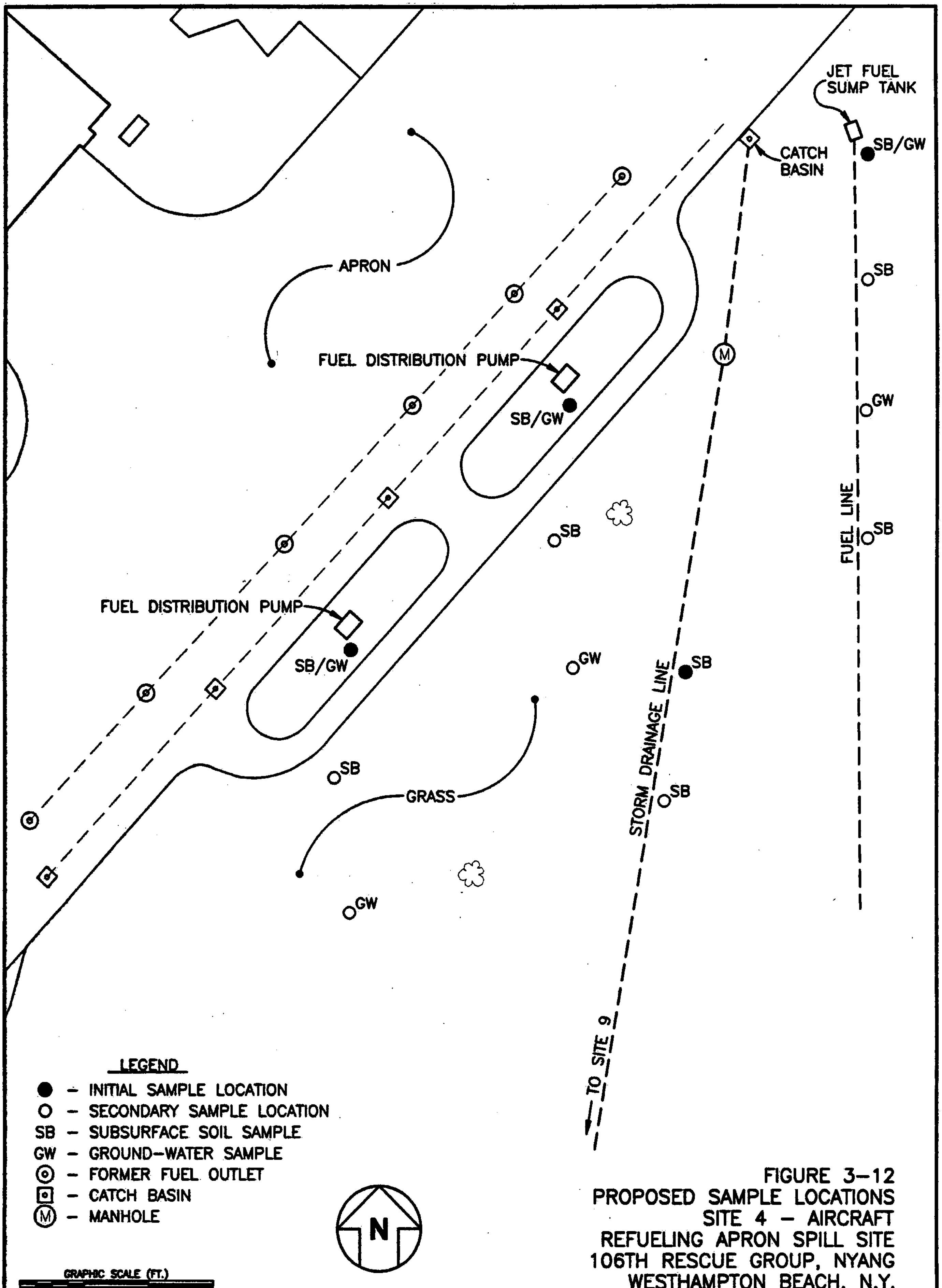


FIGURE 3-12
PROPOSED SAMPLE LOCATIONS
SITE 4 - AIRCRAFT
REFUELING APRON SPILL SITE
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

the initial and/or secondary ground-water sample locations. A second round of ground-water sampling will be conducted from these wells if installed. Three to 12 shallow ground-water samples will be collected from Site 4.

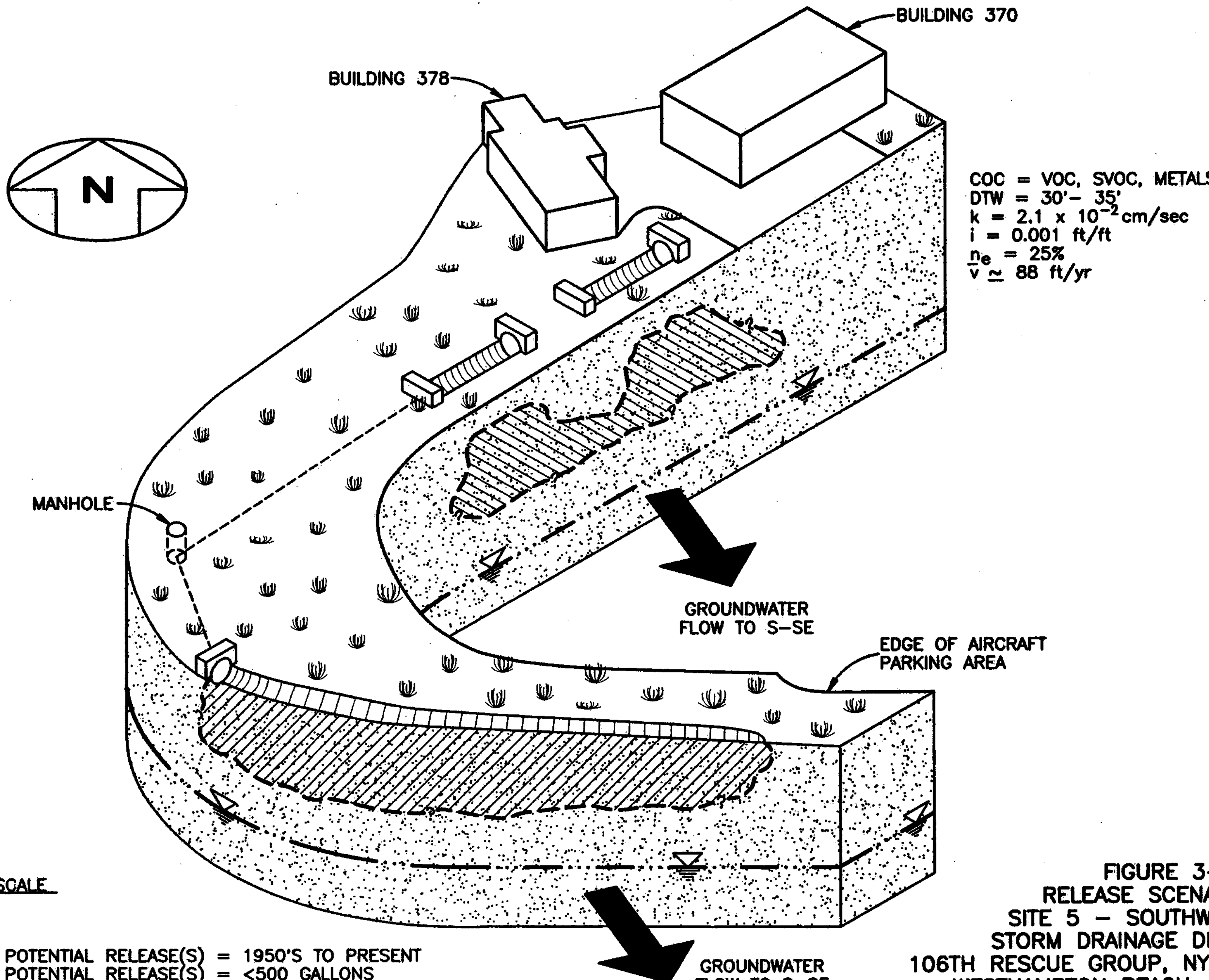
A minimum of 19 and a maximum of 48 samples will be collected at Site 4. The samples will be analyzed for VOCs, SVOCs, and lead in the on-site analytical laboratory.

3.7.5 Site 5 - Southwest Storm Drainage Ditch

3.7.5.1 Background

Site 5 is a storm sewer/drainage ditch that originates as a subsurface outfall on the southwest side of Building 370 (Figure 3-13). The storm sewer surfaces approximately 100 feet south of the origination point. The drainage flows southwest and remains on the surface for approximately 500 feet before it is directed below ground again for another 350 feet. The drainage then resurfaces and flows to the east for approximately 600 feet. A second outfall discharges to the last section of the drainage ditch. Because the ditch has no discharge point, the conceptual model assumes that water in the ditch infiltrates into the subsurface.

The storm sewer/drainage ditch receives rainwater from roof drains and runoff from the southwestern portion of the base. The records-search report states that an oily sheen was seen on water in the ditch during periods of heavy rain. Also, areas of stressed vegetation assumed to be small and localized, were noted during the site walkover. The records-search report estimated that the volume released was less than 500 gallons over a period of many years.



NOT TO SCALE

DATE(S) OF POTENTIAL RELEASE(S) = 1950'S TO PRESENT
VOLUME OF POTENTIAL RELEASE(S) = <500 GALLONS

FIGURE 3–13
RELEASE SCENARIO
SITE 5 – SOUTHWEST
STORM DRAINAGE DITCH
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

3.7.5.2 Constituents

The primary suspected pollutants are petroleum fuels and oils in the runoff from paved areas. Constituents of concern in fuels are VOCs, SVOCs, and metals.

3.7.5.3 Hydrogeologic Conditions

Depth to ground water at Site 5 is expected to range from 30 to 35 feet bgs. This assumption is based on measurements taken from nearby piezometers. Soils encountered during installation of the piezometers consisted of medium-grained sand with a trace of gravel.

3.7.5.4 Migration/Release Pathway

Fuels and oils may have been released on the surface where they flowed with rainwater to the storm sewer/drainage ditch. Because of the small amount of contaminants believed to have been released into the ditch, ground water is not expected to have been affected.

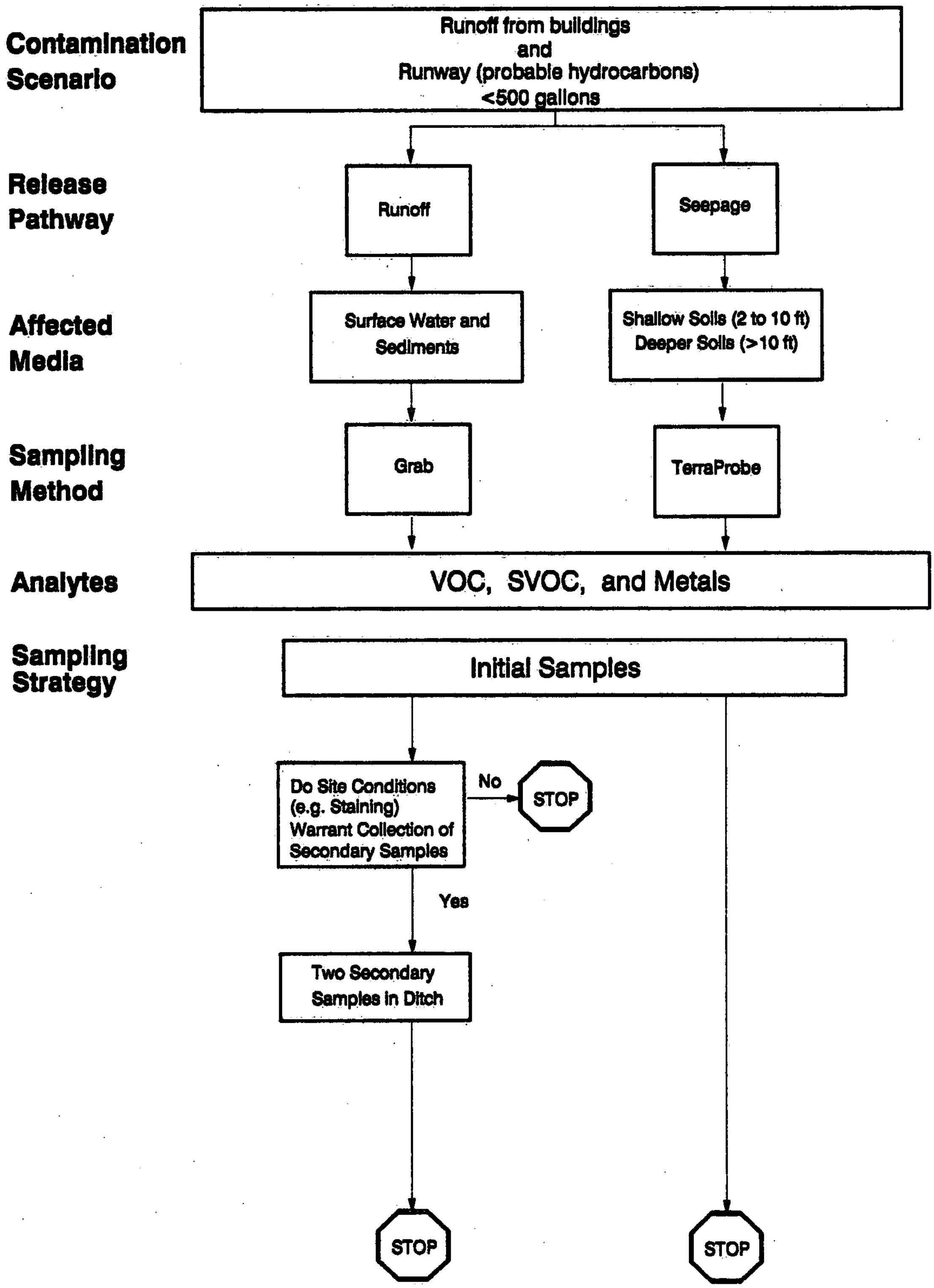
3.7.5.5 Affected Media

Media affected by the release would be sediments in the ditch and shallow and deeper subsurface soils.

3.7.5.6 Sampling Strategy

As shown on the sampling logic diagram (Figure 3-14), the potential release pathways were surface-water runoff and seepage through soils in the unsaturated zone. Affected media may

Figure 3-14 Sampling Logic Diagram
Site 5 - Southwest Storm Drainage Ditch
106th Rescue Group
New York Air National Guard



include surface water and sediments in the ditch and shallow and deeper subsurface soils in the unsaturated zone.

Sample points will be marked or staked as indicated on Figure 3-15 prior to sampling operations. Sample points will be spaced throughout the ditch and will be based on the presence of ponding areas, cut banks, areas of staining or stressed vegetation, and outfall points in the ditch. Both initial and secondary sample locations are shown in this figure.

Surface water (if present) and sediment samples will be collected from five locations in the ditch. Two secondary surface water and sediment samples may be collected if the site conditions (staining, stressed vegetation, etc.) warrant their collection; however, surface water and sediment sampling will be restricted to the ditch. Five to seven surface water and five to seven sediment samples will be collected from Site 5.

Subsurface soil samples will be collected by advancing borings with a TerraProbe at three locations along the edge of the ditch or in the ditch if site conditions permit access by the rig. One boring will be located at the northern end of the ditch, a second at the outfall point from the aircraft parking ramp adjacent to Building 395, and the third at the southern end of the ditch. Subsurface soils will be collected from 5 to 7 feet (shallow soils), 10 to 12 feet, 20 to 22 feet, and 30 to 32 feet bgs (deeper soils). If concentrations of constituents are detected above action levels in the soil samples from the 10- to 12-foot depth interval, the samples collected from 20 to 22 feet will be analyzed; similarly, the samples collected from 30 to 32 feet will be analyzed if action levels are exceeded in the samples collected from 20 to 22 feet. No further sampling of subsurface soils will be performed during this SI for Site 5. Six to 12 shallow and deep subsurface soil samples will be collected from Site 5.

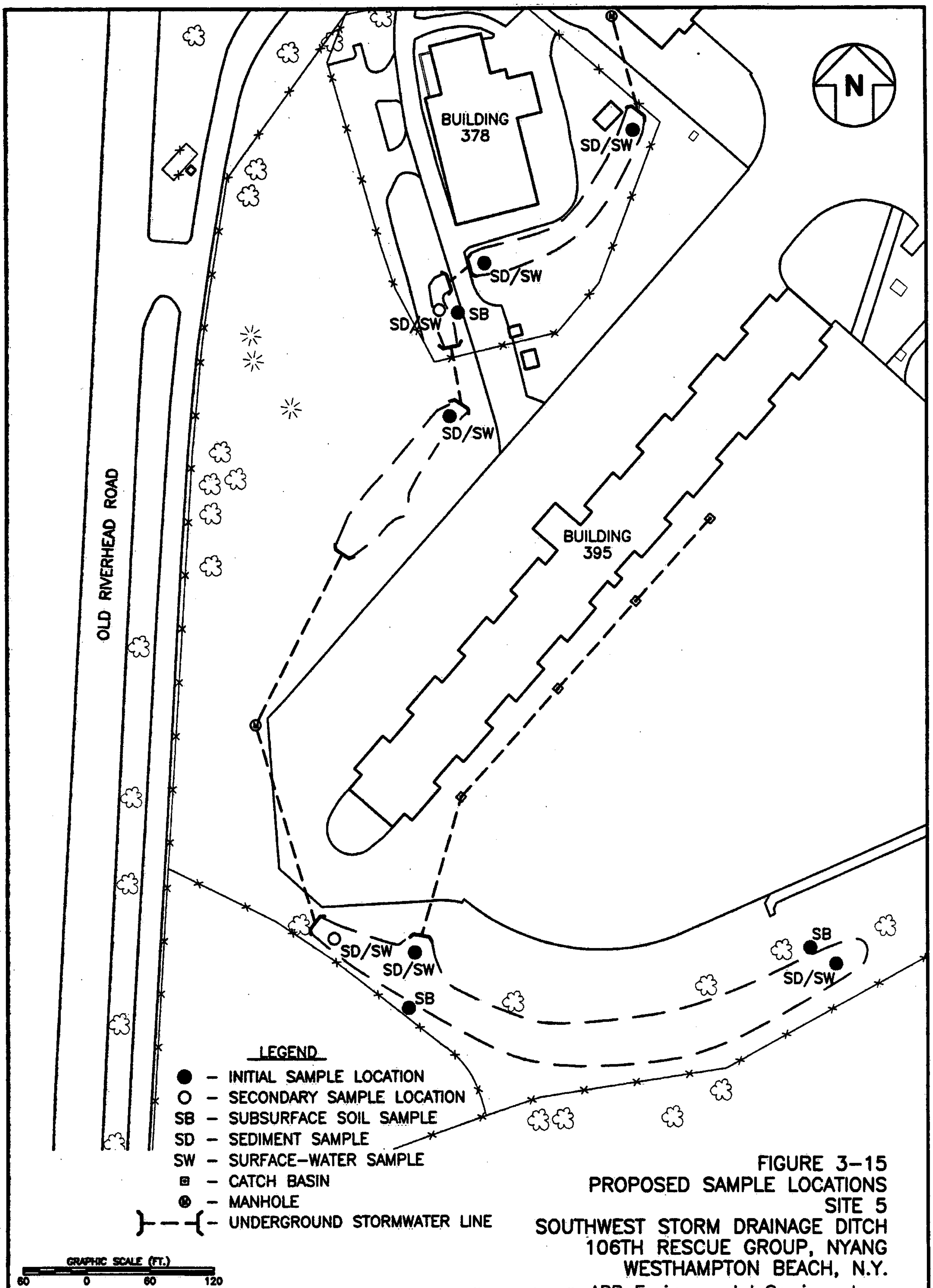


FIGURE 3-15
PROPOSED SAMPLE LOCATIONS
SITE 5
SOUTHWEST STORM DRAINAGE DITCH
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

A minimum of 16 and a maximum of 26 media samples will be collected at Site 5. The samples will be analyzed for VOCs, SVOCs, and metals in the on-site analytical laboratory.

3.7.6 Site 6 - Petroleum, Oil, and Lubricant Tank Farm

Site 6, the POL Tank Farm, will be investigated under a separate contract through the Army Corps of Engineers under the Formerly Used Defense Sites program.

3.7.7 Site 7 - Fire Training Area

As discussed in Section 2.2, Site 7 has been previously investigated and a site characterization of the Former Fire Training Area was conducted by ABB-ES (1989). The resulting report recommends no further action at this site. A follow-up investigation evaluated the presence of 2-butanone in ground-water samples and determined that the samples were contaminated during sample collection and that the ground water was not contaminated.

3.7.8 Site 8 - Old Base Septic Systems

3.7.8.1 Background

Site 8 is divided into 21 discrete subsites (Sites 8A through 8U). Site 8Q is further divided into seven discrete systems attached to Building 250 (i.e., Sites 8QA through 8QG). Site 8 consists of numerous underground structures that make up the septic disposal system on the base property. These structures include septic tanks, cesspools, distribution boxes, and oil/mud traps. Some of these structures have been associated with maintenance buildings in which hazardous materials had been used. Previous sampling and analyses of sludges and liquid from approximately one-third of the structures indicated significant concentrations of VOCs and SVOCs. Figures 3-16 and 3-17 are typical septic system or cesspool configurations.

3.7.8.2 Constituents

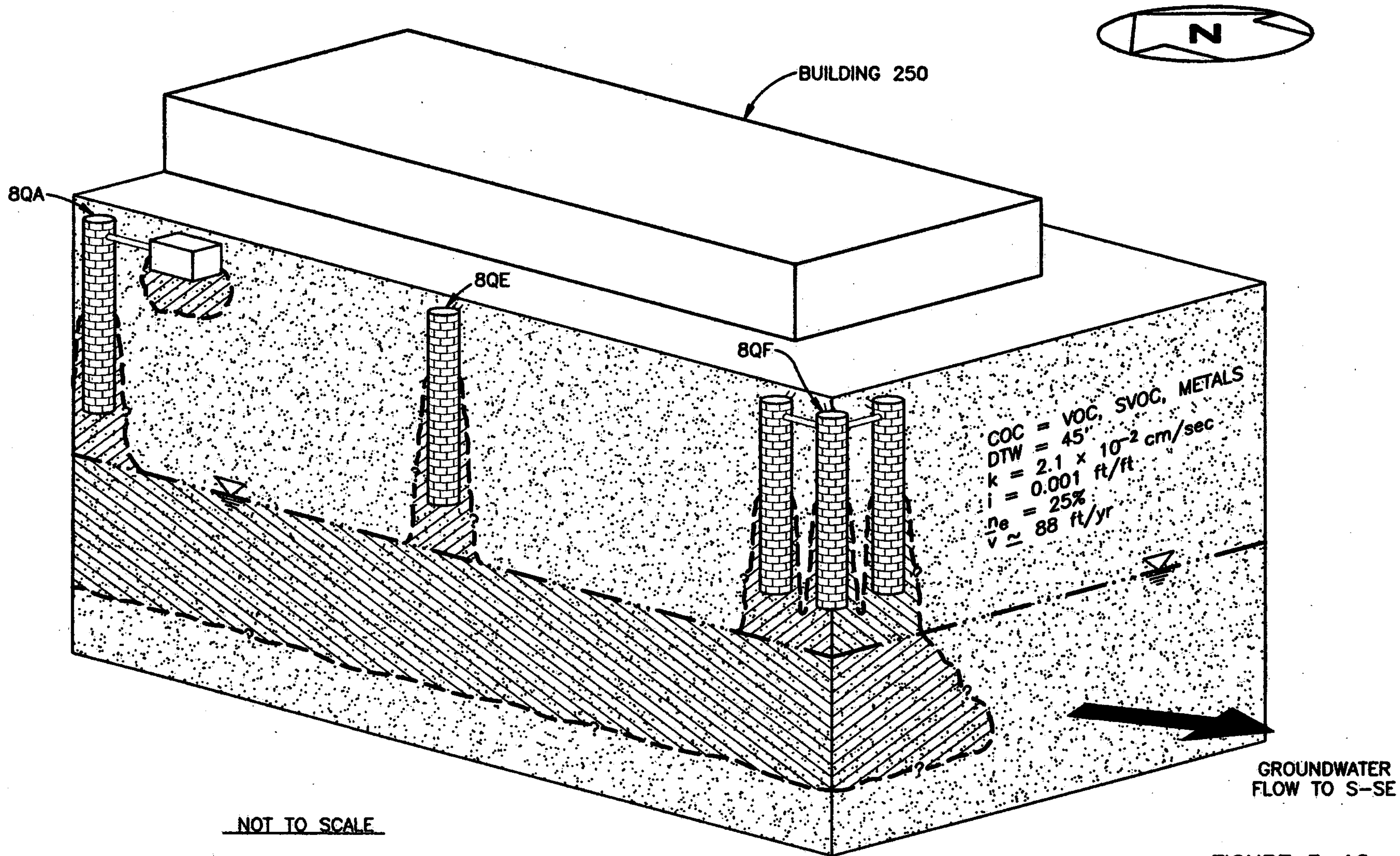
The constituents detected during the sludge and liquid analyses in October 1991 included VOCs and SVOCs. Metals were not detected with X-ray fluorescence, but are still of concern for this SI.

3.7.8.3 Hydrogeologic Conditions

The hydrogeologic conditions across Site 8 vary as described in Subsection 2.3. Depth to ground water is expected to be approximately 45 feet bgs at the north end of Site 8 and approximately 30 feet bgs at the south end.

3.7.8.4 Migration/Release Pathway

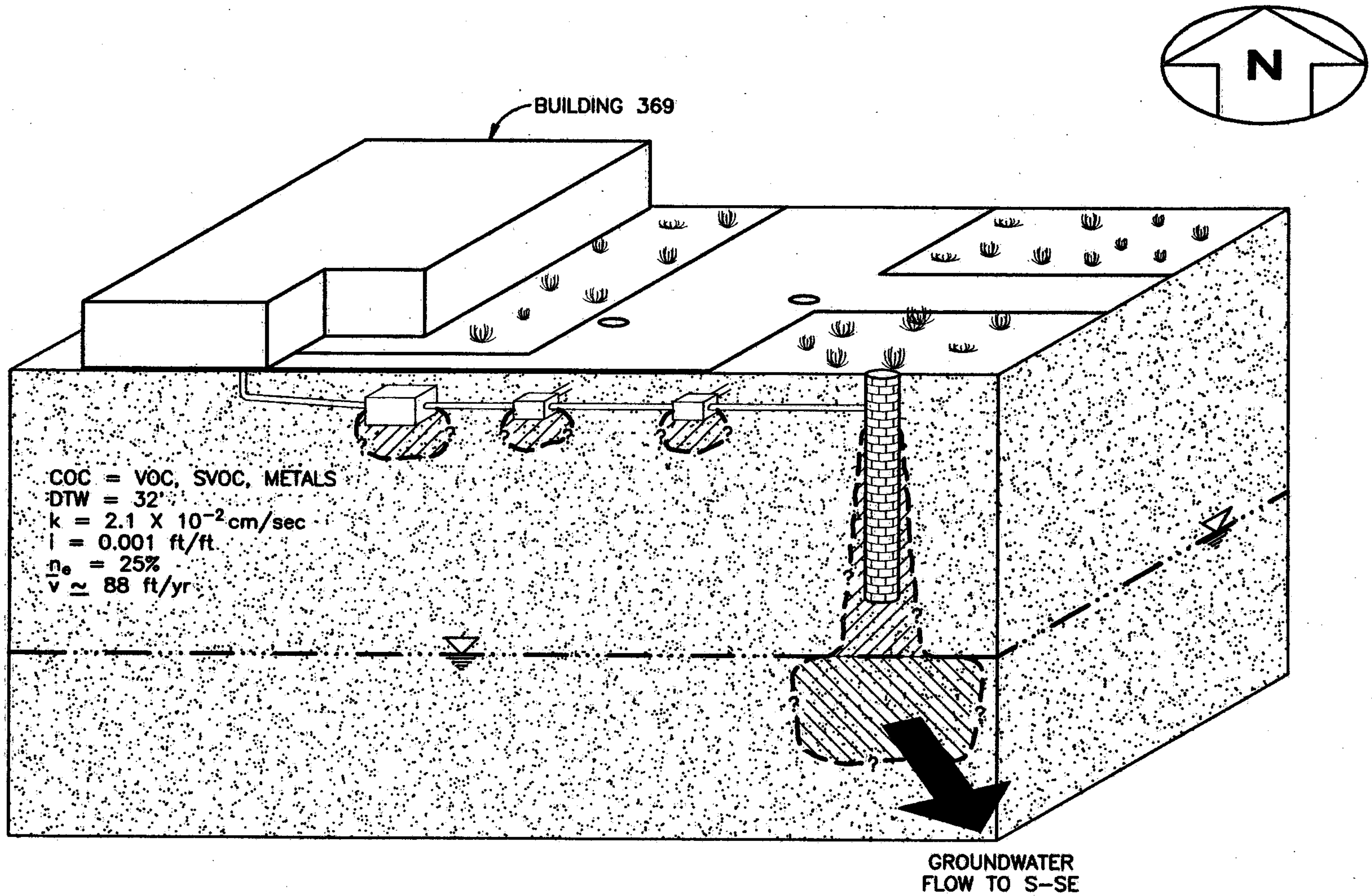
Liquids entering solid containers such as septic tanks, distribution boxes, and oil/water separators may have been released through cracks in the walls of the containers. The cesspools and dry wells had open bottoms with direct access to the subsurface. Trace levels of contaminants would be anticipated in these liquids since these structures are used for wastewater treatment. However, compared to the total volume of fluids entering the system, the concentrations of contaminants were probably low. Liquids discharged from the cesspools could migrate to and with the ground water.



DATE(S) OF POTENTIAL RELEASE(S) = PERIOD OF OPERATION
VOLUME OF POTENTIAL RELEASE(S) = UNKNOWN

FIGURE 3-16
RELEASE SCENARIO
SITE 8 - (SUBUNITS 8QA, 8QE, 8QF)
OLD BASE SEPTIC SYSTEMS
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.



NOT TO SCALE

DATE(S) OF POTENTIAL RELEASE(S) = PERIOD OF OPERATION
VOLUME OF POTENTIAL RELEASE(S) = UNKNOWN

FIGURE 3-17
RELEASE SCENARIO
SITE 8 – (SUBUNIT 8H)
OLD BASE SEPTIC SYSTEMS
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

3.7.8.5 Affected Media

Media affected by the release would be deep subsurface soils beneath the cesspools, dry wells, and other potentially leaking vessels. Although the comparative volume of contaminants may be small, some of the septic systems have been operating since the base opened (almost 50 years); therefore, the conceptual model assumes that ground water has been affected in some areas.

3.7.8.6 Sampling Strategy

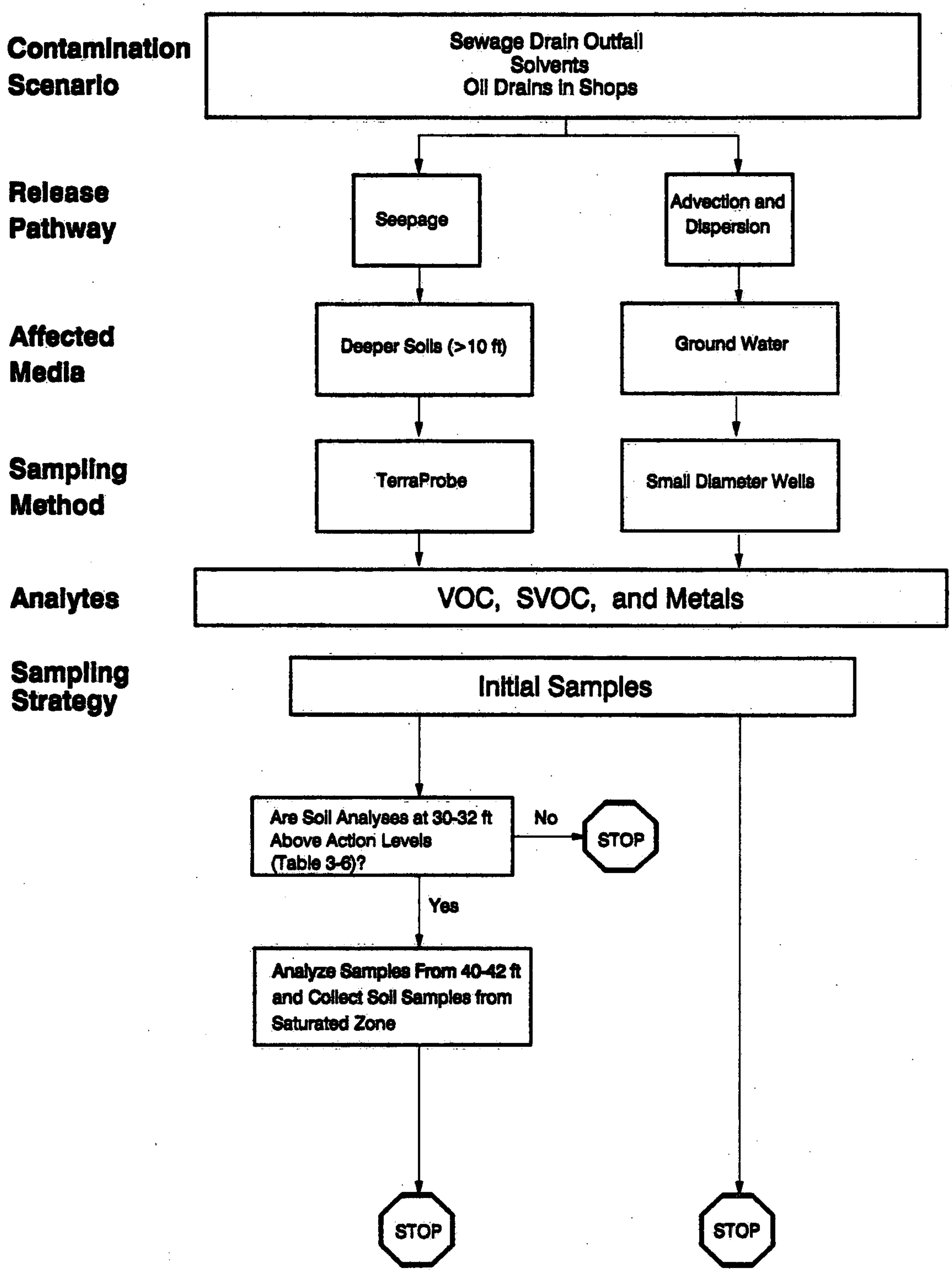
As shown on the sampling logic diagram (Figure 3-18), the potential release pathways were seepage through deeper subsurface soils and possibly advection and dispersion in the ground water. Affected media may include deeper subsurface soils in the unsaturated and saturated zones and ground water.

Approximately 96 cesspools or drywells, constitute the septic system across the base. Because of the large number of these structures and the size of the area over which they are located, Site 8A through 8U were grouped into five "cells" (Figure 3-19) for this investigation. Sample points will be marked or staked within the five cells prior to sampling operations. The sampling strategy for each of the five cells is outlined below.

Sampling Strategy - CELL 1

Cell 1 encompasses the northwest portion of the base. Within this area, nine cesspool clusters or single cesspool structures have been identified: 8QA, 8QB, 8QC/8N, 8QD, 8QE, 8QF, 8QG, 8M, and 8O. For purposes of this SI, 8QC and 8N are considered a single subunit due to their

Figure 3-18 Sampling Logic Diagram
Site 8 - Old Base Septic System
106th Rescue Group
New York Air National Guard



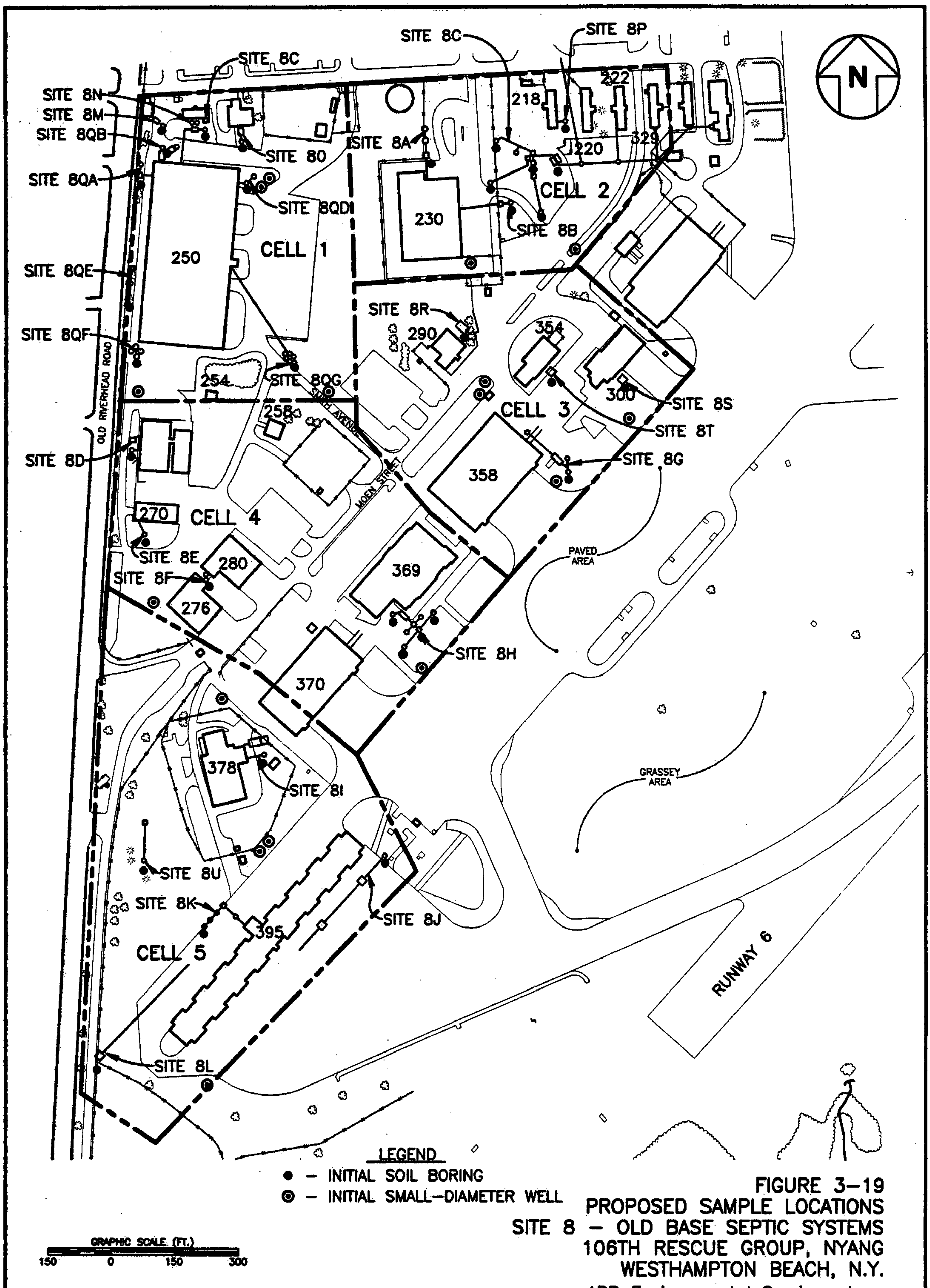


FIGURE 3–19
PROPOSED SAMPLE LOCATIONS
SITE 8 – OLD BASE SEPTIC SYSTEMS
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.
ABB Environmental Services, Inc.

proximity to one another. Subsurface soil samples will be collected by advancing borings with a TerraProbe immediately adjacent to and south of one of the cesspools at each location.

Deep subsurface soil samples will be collected from 20 to 22 feet, 30 to 32 feet, and 40 to 42 feet bgs. If hazardous constituents are detected above action levels in the soil samples from 30 to 32 feet, the samples collected from 40 to 42 feet will be analyzed. Three deeper subsurface soil samples in the zone of saturation will also be collected from the small-diameter well borings discussed in the next paragraph. No further subsurface soil sampling will be conducted. Twenty-one to 30 deep subsurface soil samples will be collected at Cell 1.

Two rounds of ground-water samples will be collected from four small-diameter wells installed in Cell 1. A shallow and deep small-diameter well cluster will be installed south of 8QD. Shallow small-diameter wells, one at each location, will also be installed south of 8QF and 8QG. No further ground-water sampling will be conducted. Two deep and six shallow ground-water samples will be collected from Cell 1.

Sampling Strategy - CELL 2

Cell 2 encompasses the northeast portion of the base and is located east of and adjacent to Cell 1. Within this area, four cesspool clusters or single cesspool structures have been identified: 8A, 8B, 8C, and 8P. Subsurface soil samples will be collected by advancing borings with a TerraProbe immediately adjacent to and south of one of the cesspools at 8A, 8B, and 8P. TerraProbe borings will also be advanced immediately adjacent to and south of four cesspools at 8C due to the scatter and large number of cesspools in this area.

Deep subsurface soil samples will be collected from 20 to 22 feet, 30 to 32 feet, and 40 to 42 feet bgs in each boring. If constituents are detected above action levels in the soil samples from

30 to 32 feet, the samples collected from 40 to 42 feet will be analyzed. One deeper subsurface soil sample from the zone of saturation will also be collected from one of the small-diameter well borings discussed in the next paragraph. The saturated zone subsurface soil sample will be collected from the well boring located closest to a potential source. No further subsurface soil sampling will be conducted. Fifteen to 22 deep subsurface soil samples will be collected from Cell 2.

Two rounds of ground-water samples will be collected from shallow small-diameter wells installed at two locations. The small-diameter wells, one at each location, will be installed south and southwest of 8B and 8C. No further ground-water sampling will be conducted. Four ground-water samples will be collected from Cell 2.

Sampling Strategy - CELL 3

Cell 3 encompasses the east-central portion of the base southeast of Cell 1 and south of Cell 2. Within this area, four cesspool clusters or single cesspool structures have been identified: 8G, 8R, 8S, and 8T. Subsurface soil samples will be collected by advancing borings with a TerraProbe immediately adjacent to and south of one of the cesspools at each subunit.

Deep subsurface soil samples will be collected from 20 to 22 feet, 30 to 32 feet, and 40 to 42 feet bgs. If constituents are detected above action levels in the soil sample from the 30 to 32 feet, the sample collected from 40 to 42 feet will be analyzed. Two deeper subsurface soil samples from the zone of saturation will also be collected from two of the small-diameter well borings discussed in the next paragraph. The saturated samples will be collected from the two well borings closest to a potential source. No further subsurface soil sampling will be conducted. Ten to 14 deep subsurface soil samples will be collected from Cell 3.

Two rounds of ground-water samples will be collected from small-diameter wells installed at three locations in Cell 3. A shallow and deep small-diameter well cluster will be installed southeast of Building 290. Shallow small-diameter wells will also be installed south of 8G and 8S. No further ground-water sampling will be conducted. Two deep and six shallow ground-water samples will be collected from Cell 3.

Sampling Strategy - CELL 4

Cell 4 encompasses the west-central portion of the base and is located southwest of Cell 3 and south of Cell 1. Within this area, four cesspool clusters or single cesspool structures have been identified: 8D, 8E, 8F, and 8H. Deep subsurface soil samples will be collected by advancing borings with a TerraProbe immediately adjacent to and south of one of the cesspools at 8D, 8E, and 8F. TerraProbe borings will also be advanced immediately adjacent to and south of four cesspools at 8H due to the scatter and large number of cesspools in this subunit.

Deep subsurface soil samples will be collected from 20 to 22 feet, 30 to 32 feet and 40 to 42 feet bgs. If constituents are detected above action levels in the soil samples from 30 to 32 feet, the samples collected from 40 to 42 feet will be analyzed. One deeper subsurface soil sample from the zone of saturation will also be collected from one of the small-diameter well borings discussed in the next paragraph. The saturated sample will be collected from the well boring closest to a potential source. No further subsurface soil sampling will be conducted. Fifteen to 22 deep subsurface soil samples will be collected from Cell 4.

Two rounds of ground-water samples will be collected from shallow small-diameter wells installed at two locations. One small-diameter well will be installed west of Building 276 and the other will be installed south of 8H. No further ground-water sampling will be performed at Cell 4. Four shallow ground-water samples will be collected from Cell 4.

Sampling Strategy - CELL 5

Cell 5 encompasses the southern portion of the base and is south of Cell 4. Within this area, five cesspool clusters and/or single cesspool structures have been identified: 8I, 8J, 8K, 8L, and 8U. Subsurface soil samples will be collected by advancing borings with a TerraProbe immediately adjacent to and south of one of the cesspools at each subunit.

Deep subsurface soil samples will be collected from 20 to 22 feet, 30 to 32 feet, and from 40 to 42 feet bgs. If constituents are detected above action levels in the soil samples from 30 to 32 feet, the samples collected from 40 to 42 feet will be analyzed. No further subsurface soil sampling will be conducted. Ten to 15 deep subsurface soil samples will be collected from Cell 5.

Two rounds of ground-water samples will be collected from small-diameter wells installed at three locations. A shallow and deep small-diameter well cluster will be installed southeast of Building 378. One shallow small-diameter well will be installed north of Building 378 and another will be installed south of Building 395. No further ground-water sampling will be conducted. Two deep and six shallow ground-water samples will be collected from Cell 5.

A minimum of 103 and a maximum of 135 media samples will be collected from Cells 1 through 5. The samples will be analyzed for VOCs, SVOCs, and metals in the on-site analytical laboratory.

3.7.9 Site 9 - Ramp Drainage Outfall

3.7.9.1 Background

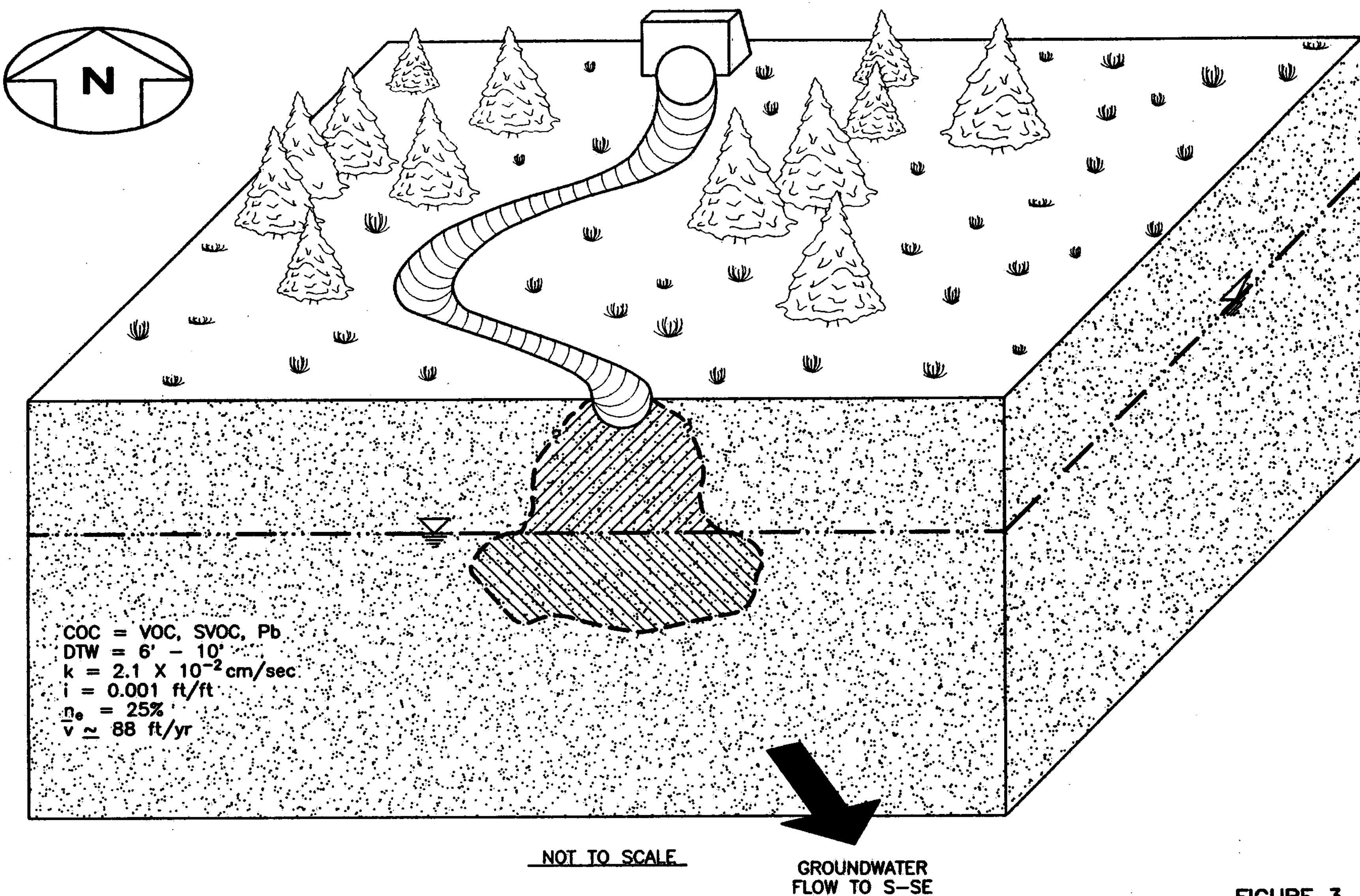
Site 9 is located approximately 1,100 feet south of the refueling apron (Site 4). The surface drainage from the refueling apron is collected by five catch basins near the fuel outlets and then directed through underground pipes to the drainage outfall at the north end of Site 9. The drainage extends approximately 400 feet south of the outfall point, where it infiltrates into the subsurface. Spills on the refueling apron during refueling operations from the 1950s through the 1980s could have resulted in releases to the drainage at Site 9 (Figure 3-20).

3.7.9.2 Constituents

Contaminants entering the drainage may have included fuels, oils, and solvents. Constituents of concern are VOCs, SVOCs, and metals.

3.7.9.3 Hydrogeologic Conditions

Depth to ground water is expected to be approximately 6 to 10 feet bgs. The depth to groundwater was inferred by extrapolating the water-table contours on the potentiometric surface map and comparing those to the surface elevations at Site 9. Soils are expected to be similar to those encountered in previous investigations.



DATE(S) OF POTENTIAL RELEASE(S) = 1950'S TO 1980'S
VOLUME OF POTENTIAL RELEASE(S) = UNKNOWN

FIGURE 3-20
RELEASE SCENARIO
SITE 9 - RAMP DRAINAGE OUTFALL
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

3.7.9.4 Migration/Release Pathway

Reports of stressed vegetation were not indicated in the records-review report. Potential contaminants would have discharged from the outfall into the drainage ditch and surrounding area affecting sediments, surface water, and soils. Although only small amounts of contaminants are estimated to have been released to this site, ground-water contamination is presumed because of the inferred shallow water table.

3.7.9.5 Affected Media

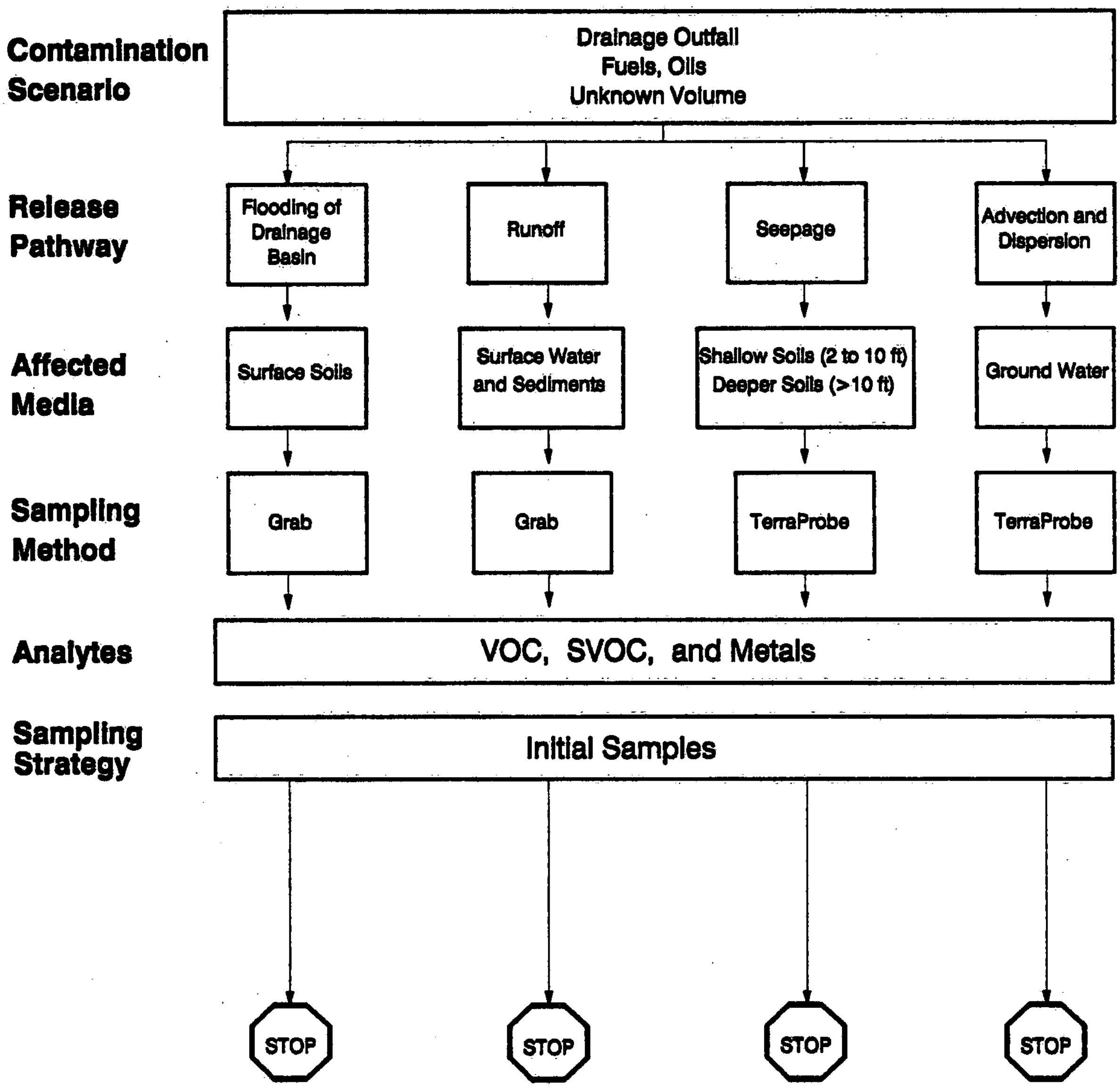
Media affected by the release would be surface water, sediments, surface soils, shallow subsurface soils along the banks of the drainage ditch, and ground water.

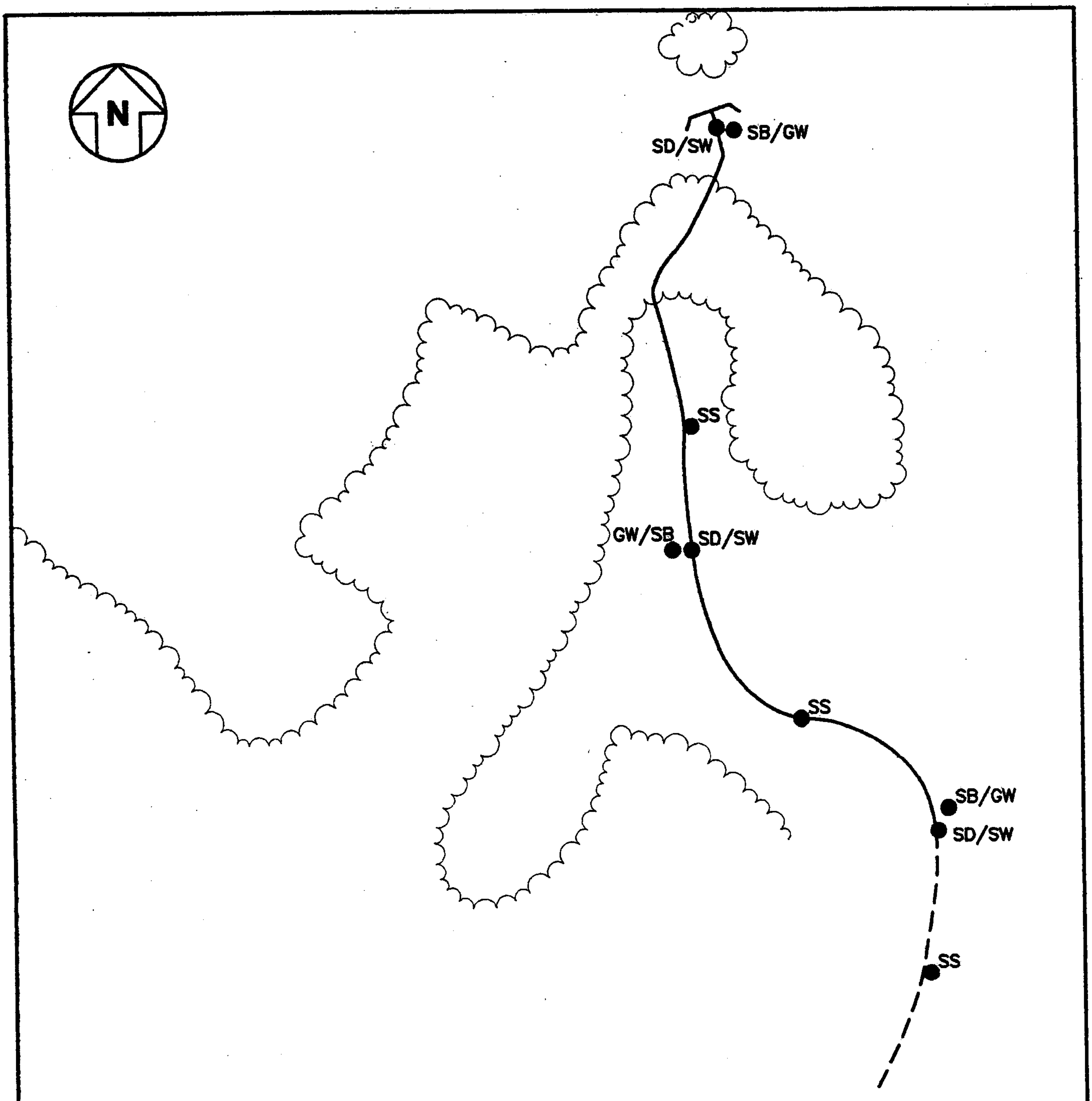
3.7.9.6 Sampling Strategy

As shown on the sampling logic diagram (Figure 3-21), the potential release pathways were surface-water runoff, seepage through the unsaturated zone, and possibly through advection and dispersion in the ground water. Affected media may include surface soils, surface water and sediments in the ditch, shallow subsurface soils in the unsaturated zone, and shallow ground water.

Sample locations will be marked or staked as indicated on Figure 3-22 prior to sampling operations. Sample points will be selected near the drainage outfall, near the end of the visible ditch, and approximately halfway between those two locations. Location selection will be based on the presence of ponded water, sand bars, and areas of staining or stressed vegetation.

Figure 3-21 Sampling Logic Diagram
Site 9 - Ramp Drainage Outfall
106th Rescue Group
New York Air National Guard





LEGEND

● – INITIAL SAMPLE LOCATION
SD – SEDIMENT SAMPLE
SS – SURFACE SOIL SAMPLE
SB – SUBSURFACE SOIL SAMPLE
GW – GROUND-WATER SAMPLE
SW – SURFACE-WATER SAMPLE

GRAPHIC SCALE (FT.)
30 0 30 60

FIGURE 3–22
PROPOSED SAMPLE LOCATIONS
SITE 9 – RAMP DRAINAGE OUTFALL
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

Surface water (if present) and sediment samples will be collected from three locations in the ditch. No additional surface-water or sediment samples will be collected during the SI for Site 9. Three surface-water and three sediment samples will be collected from Site 9.

Four surface soils (0 to 2 feet bgs) will be collected from low areas adjacent to the ditch where the potential for flooding appears to be greatest. The sample points in the low areas will be located based on the presence of stains, stressed vegetation, or some other criteria indicating a potential impact. No additional surface soils will be collected during this SI for Site 9. Four surface soil samples will be collected at Site 9.

Subsurface soil samples will be collected by advancing borings with a TerraProbe at three locations along the edge of the ditch or in the ditch if site conditions permit access by the rig. Borings will be located near the drainage outfall, near the end of the visible channel, and approximately halfway between those two locations. Subsurface soils will be collected from 5 to 7 feet bgs (shallow, unsaturated soils) and 10 to 12 feet bgs (deeper, saturated soils). No additional subsurface soil samples will be collected during the SI for Site 9. A total of six subsurface soil samples will be collected at Site 9.

Shallow ground-water samples will be collected from the three TerraProbe boring locations. No additional ground-water sampling will be conducted during the SI for Site 9. Three ground-water samples will be collected at Site 9.

A total of 19 media samples will be collected from Site 9. The samples will be analyzed for VOCs, SVOCs, and metals in the on-site analytical laboratory.

3.7.10 Site 10 - Waste Stripper Tank #61, Building 370

3.7.10.1 Background

Site 10 is within 10 feet northwest of Building 370 (Figure 3-23). This site was added to the IRP in December 1992. The site consists of a 1,200-gallon underground tank which received spent solvent from stripping vats. The system has been shut down, and solvents were pumped from the tank. However, the tank contained fluid (possibly water) during a site visit in February 1994. The age of the tank and possible release volumes are currently unknown.

3.7.10.2 Constituents

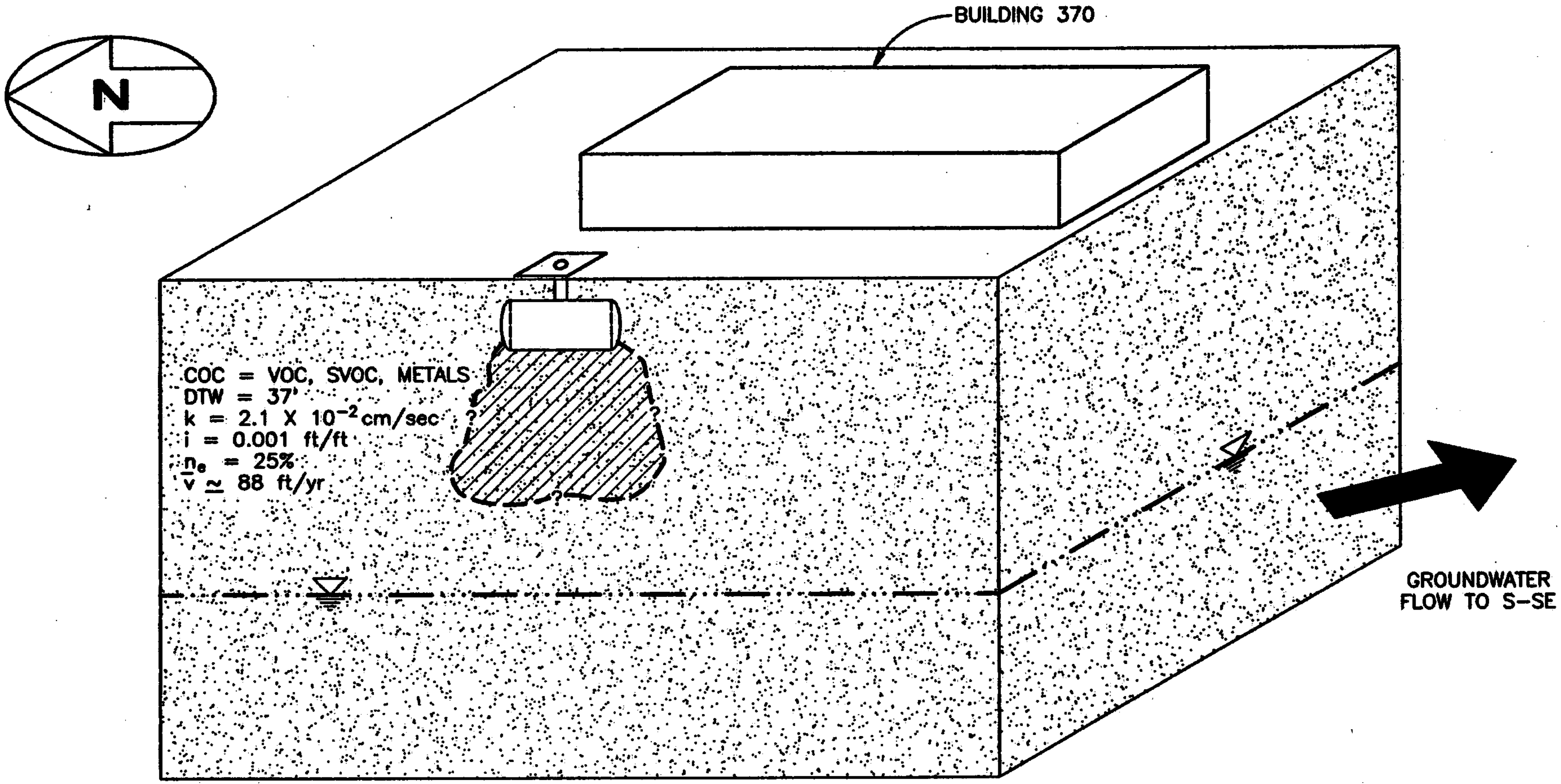
The tank may have contained solvents, fuels, and oils. Constituents of concern in these substances are VOCs, SVOCs, and metals.

3.7.10.3 Hydrogeologic Conditions

Depth to ground water is expected to be approximately 37 feet bgs. This assumption is based on measurements of water levels in nearby piezometers. Soils encountered during installation of the piezometers consisted of medium-grained sand with a trace of gravel.

3.7.10.4 Migration/Release Pathway

If the underground tank or associated piping leaked, fluids could have migrated into soils adjacent to the tank and then downward to ground water. Once in the ground water, contaminants would have migrated in the direction of ground-water movement.



NOT TO SCALE

DATE(S) OF POTENTIAL RELEASE(S) = PERIOD OF OPERATION
VOLUME OF POTENTIAL RELEASE(S) = UNKNOWN

FIGURE 3-23
RELEASE SCENARIO
SITE 10 – WASTE STRIPPER
TANK #61, BUILDING 370
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

3.7.10.5 Affected Media

Soils adjacent to the tank and ground water beneath the tank may have been affected. The tank was not filled from the surface; therefore, the conceptual model assumes that near-surface (0 to 4 feet) soils have not been affected.

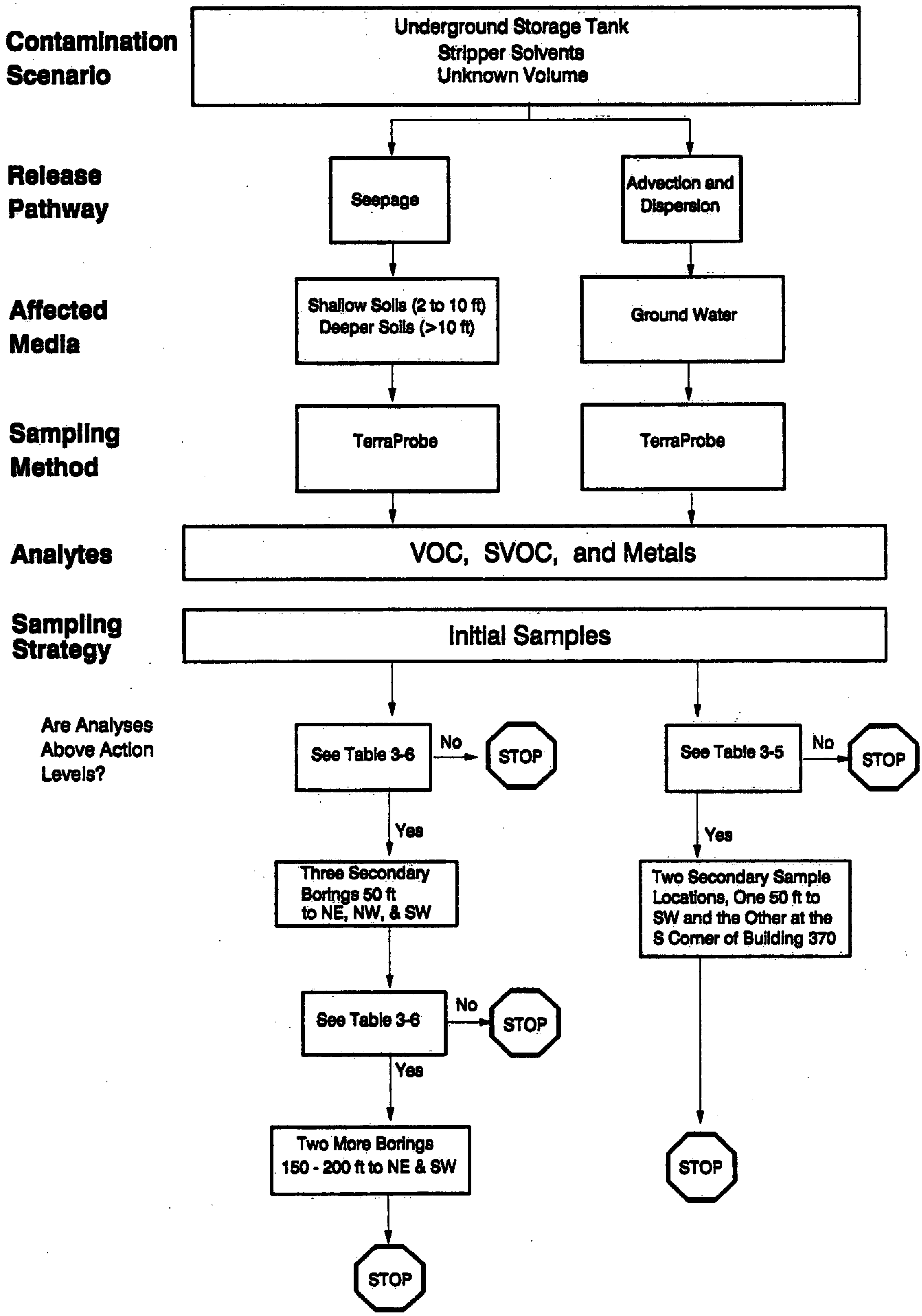
3.7.10.6 Sampling Strategy

As shown on the sampling logic diagram (Figure 3-24), the potential release pathways were seepage through the unsaturated zone and through advection and dispersion in the ground water. Affected media may include shallow and deeper subsurface soils in the unsaturated zone and ground water.

Sample points will be marked or staked as indicated on Figure 3-25 prior to sampling operations. The initial sample locations will be placed within five feet of each of the four corners of the tank. ABB-ES recommends that the contents of the tank be removed and pipes or openings to the tank be sealed prior to sampling to ensure that potential future releases will not occur. A release occurring after sample collection would alter the interpretation of the assessment.

Subsurface soil samples will be collected by advancing borings with a TerraProbe. Samples will be collected from 5 to 7 feet bgs(shallow subsurface soils), 20 to 22 feet, 28 to 30 feet, and 40 to 42 feet bgs (deep subsurface soils). If constituents are detected above action levels in soil samples from these initial borings, three secondary borings will be advanced at locations 50 feet from the tank in the northeast, northwest, and southwest directions. Subsurface soil samples will be collected from 28 to 30 feet and 40 to 42 feet bgs in the secondary borings (i.e., deeper subsurface soil samples only). If samples from these borings contain constituents above action

Figure 3-24 Sampling Logic Diagram
Site 10 - Waste Stripper Tank #61, Building 370
106th Rescue Group
New York Air National Guard



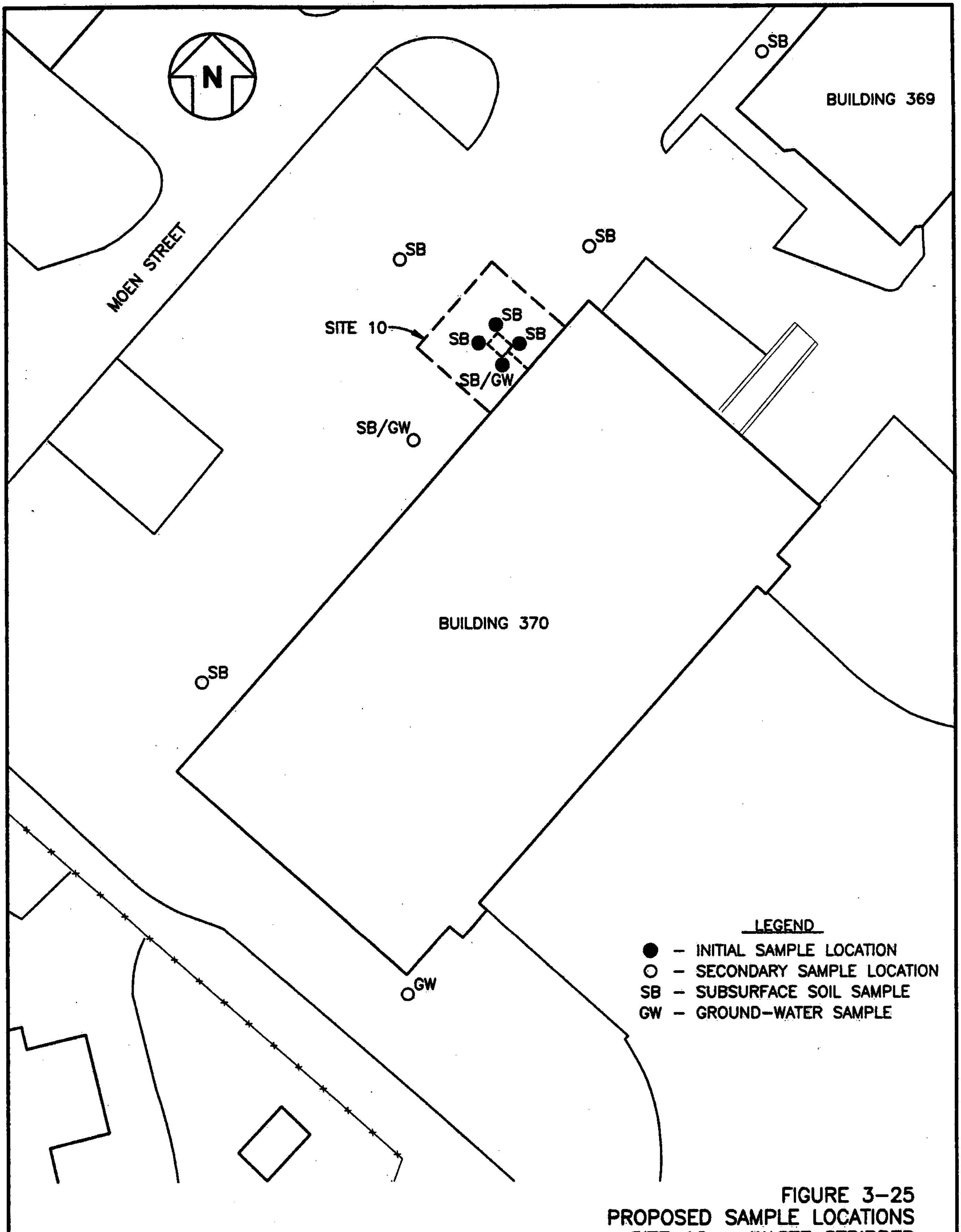


FIGURE 3–25
PROPOSED SAMPLE LOCATIONS
SITE 10 – WASTE STRIPPER
TANK #61, BUILDING 370
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.
ABB Environmental Services, Inc.

levels, two more borings will be advanced at locations between 150 and 200 feet from the tank in the northeast and southwest directions. Subsurface samples will be collected from the same depth intervals in the third set of borings as were collected from the secondary borings (i.e., deep subsurface soil samples only). No further subsurface soil samples will be collected during this SI for Site 10. A total of 16 to 26 subsurface soil samples will be collected at Site 9.

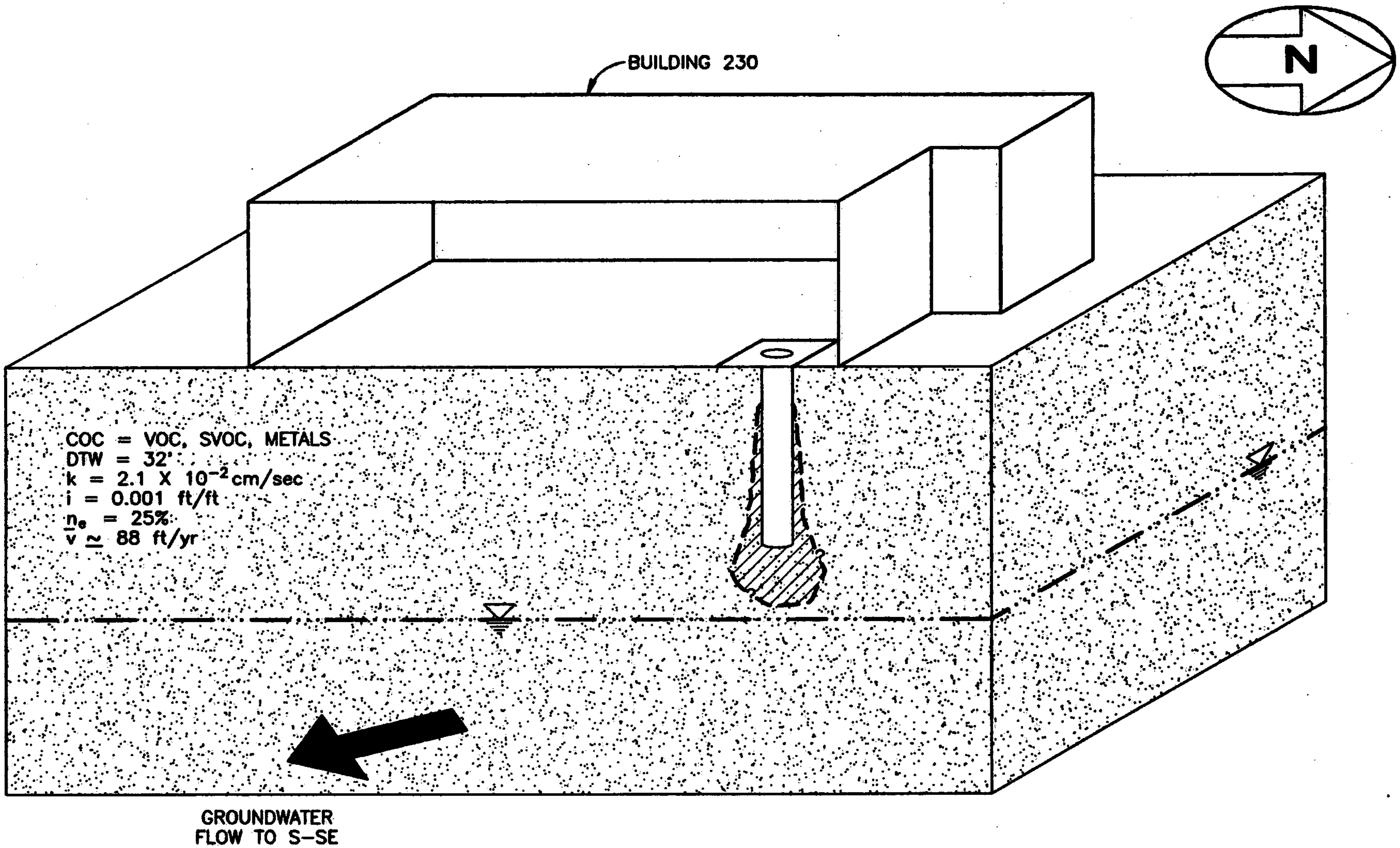
Two ground-water samples will be collected from the boring located at the southern tank corner. These samples will be collected from two intervals in the boring. The first will be collected no deeper than five feet below the water-table; the second will be collected 20 feet below the first. If constituents are detected above action levels in either sample, four secondary ground-water samples will be collected from two locations the same intervals as the initial samples. One location will be 50 feet downgradient (southwest) of the tank, and the other will be collected at the southern corner of Building 370. No additional ground-water sampling will be conducted during the SI for Site 10. Two to six ground-water samples will be collected at Site 10.

A minimum of 19 and maximum of 32 media samples will be collected at Site 10. The samples will be analyzed for VOCs, SVOCs, and metals in the on-site analytical laboratory.

3.7.11 Site 11 - Waste Oil Vessel, Building 230

3.7.11.1 Background

Site 11 is an underground steel vessel located inside Building 230, which is used for heavy equipment maintenance (Figure 3-26). This site was added to the IRP in December 1992. The structure is an underground steel vessel approximately 2.5 feet in diameter and 18 feet deep. The vessel has a bottom and an opening on the side approximately six feet above the bottom.



NOT TO SCALE

DATE(S) OF POTENTIAL RELEASE(S) = PERIOD OF OPERATION
VOLUME OF POTENTIAL RELEASE(S) = UNKNOWN

FIGURE 3-26
RELEASE SCENARIO
SITE 11 – WASTE OIL
VESSEL, BUILDING 230
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

This opening appears to be piping from elsewhere in the garage. This vessel may be associated with the hydraulic-lift system in the garage. The vessel was partially filled with an oil believed to be waste motor oil or hydraulic oil. The contents have been pumped out and disposed of. Records regarding the analyses of the contents were not available at the time this report was written. The time period the vessel was used has not been determined.

3.7.11.2 Constituents

Other than oil, constituents of concern at this site are unknown; however, the oil may also contain solvents, fuels, and metals. Constituents of concern in these substances include VOCs, SVOCs, and metals.

3.7.11.3 Hydrogeologic Conditions

Depth to ground water at this site is expected to be approximately 32 feet bgs. This assumption is based on measurements of water levels in nearby monitor wells. Soils encountered during installation of the wells consisted of medium-grained sand with a trace of gravel.

3.7.11.4 Migration/Release Pathway

If a release occurred, contaminants may have migrated into soils adjacent to the vessel and then down to ground water. Once in the ground water, wastes would have migrated in the direction of ground-water movement.

3.7.11.5 Affected Media

Soils adjacent to the tank and ground water may have been affected. The conceptual model assumes that near-surface (0 to 4 feet) soils have not been affected.

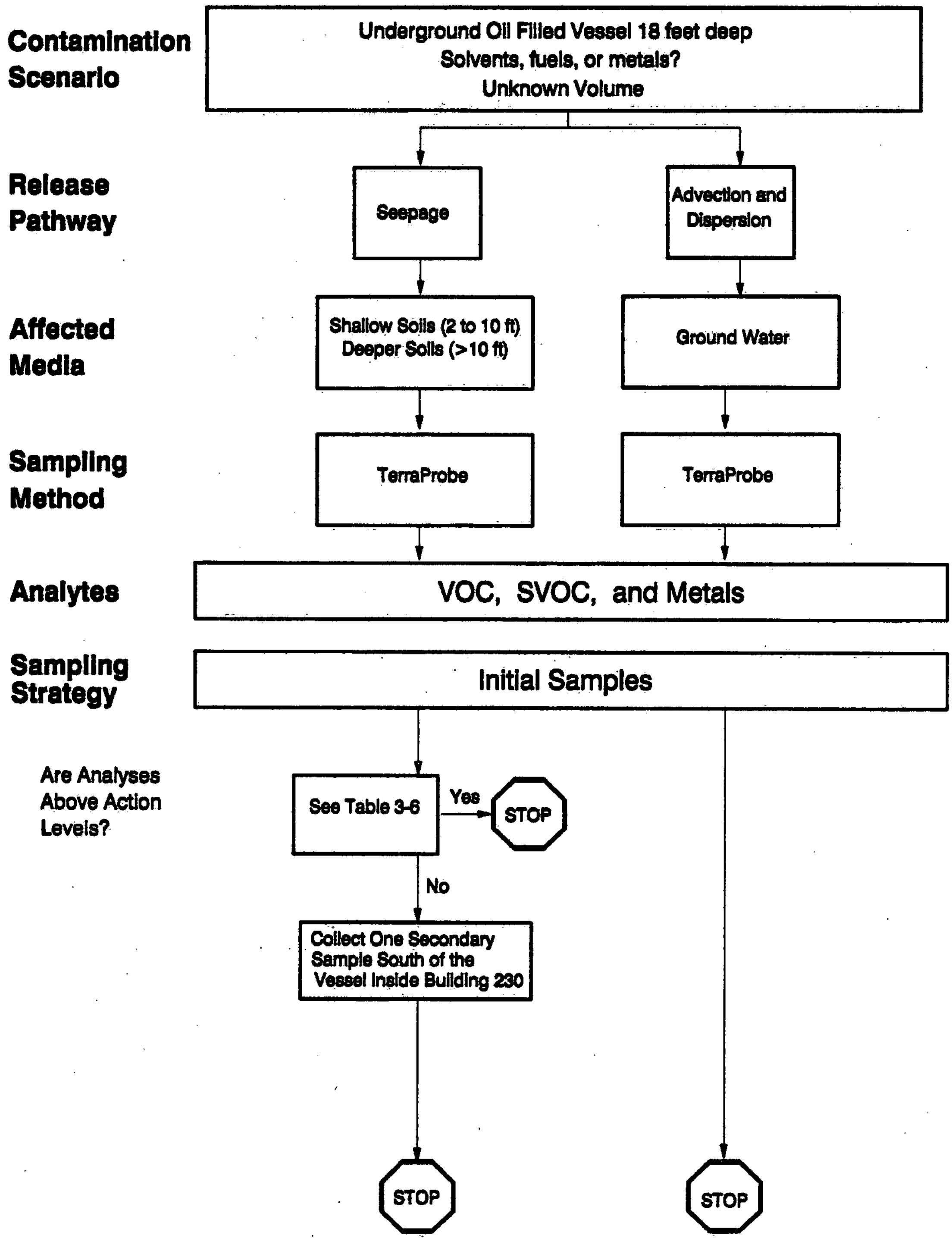
3.7.11.6 Sampling Strategy

As shown on the sampling logic diagram (Figure 3-27), the potential release pathways were seepage through the unsaturated zone and advection and dispersion in the ground water. Affected media may include shallow and deeper subsurface soils in the unsaturated zone and ground water.

Sample points will be marked or staked at this site as indicated on Figure 3-28 prior to sampling operations. Initial sample locations will be placed outside of the north and east walls of Building 230 near the northeast corner of the building.

Subsurface soil samples will be collected by advancing borings at two initial locations with a TerraProbe. The samples will be collected from 8 to 10 feet bgs (shallow subsurface soils), 15 to 17 feet, 25 to 27 feet, and 35 to 37 feet bgs (deep subsurface soils). If constituents are detected above action levels in soil samples from 25 to 27 feet, the samples from 35 to 37 feet will be analyzed. If constituents are not detected above action levels in any of the samples from either of the initial borings, a secondary boring will be advanced inside of Building 230 south of the vessel. Subsurface soil samples will be collected from the same depth intervals in this boring as were collected from the initial borings. No further subsurface soil samples will be collected following completion of this secondary boring. A total of six to 12 subsurface soil samples will be collected from Site 11.

Figure 3-27 Sampling Logic Diagram
Site 11 - Waste Oil Vessel, Building 230
106th Rescue Group
New York Air National Guard



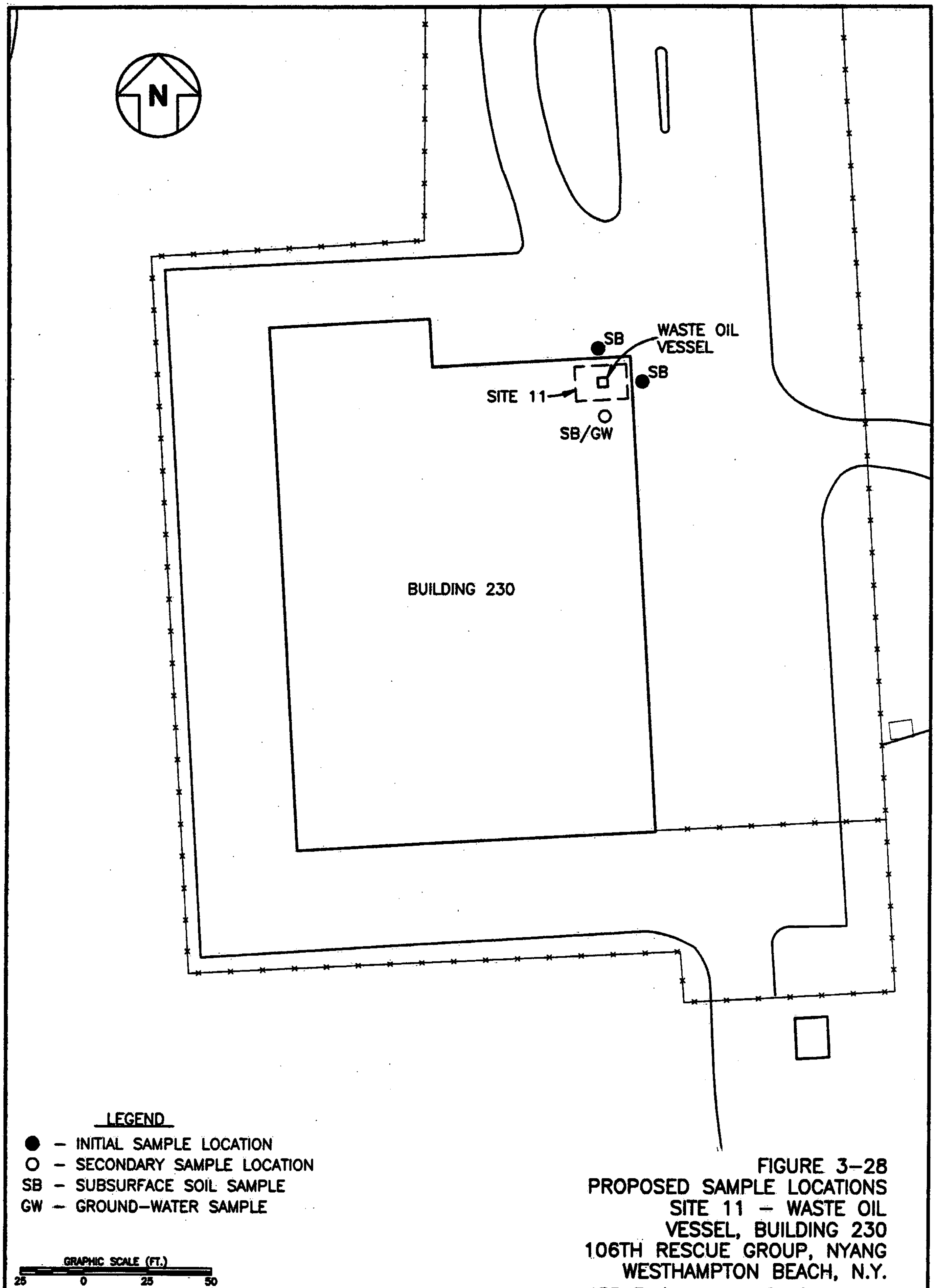


FIGURE 3–28
PROPOSED SAMPLE LOCATIONS
SITE 11 – WASTE OIL
VESSEL, BUILDING 230
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.

ABB Environmental Services, Inc.

If the secondary boring is advanced, one ground-water sample will be collected from the secondary location; otherwise the ground-water sample will be collected from one of the initial locations. One ground-water sample will be collected from Site 11.

A minimum of seven and a maximum of 13 media samples will be collected at Site 11. The samples will be analyzed for VOCs, SVOCs, and metals in the on-site analytical laboratory.

3.7.12 Background

3.7.12.1 Background

Three monitor wells and six piezometers were installed at various locations across the base during October 1991 as part of the background SI (Figure 3-29). The piezometers, monitor well, and monitor-well cluster were positioned somewhat equidistantly across the base. Four surface soil samples, four subsurface soil samples and ground-water samples from the three monitor wells were collected for chemical analysis. Results of these analyses have not been reviewed.

A logbook entry noted that ground water sampled from MW-03 had a hydrocarbon odor. Because the direction of ground-water movement is towards the south, the background monitor wells installed in the northern portion of the base are used to monitor ground water that has migrated from the part of the base that is now owned by Suffolk County. No reports have been reviewed regarding possible contamination in the area now owned by Suffolk County.

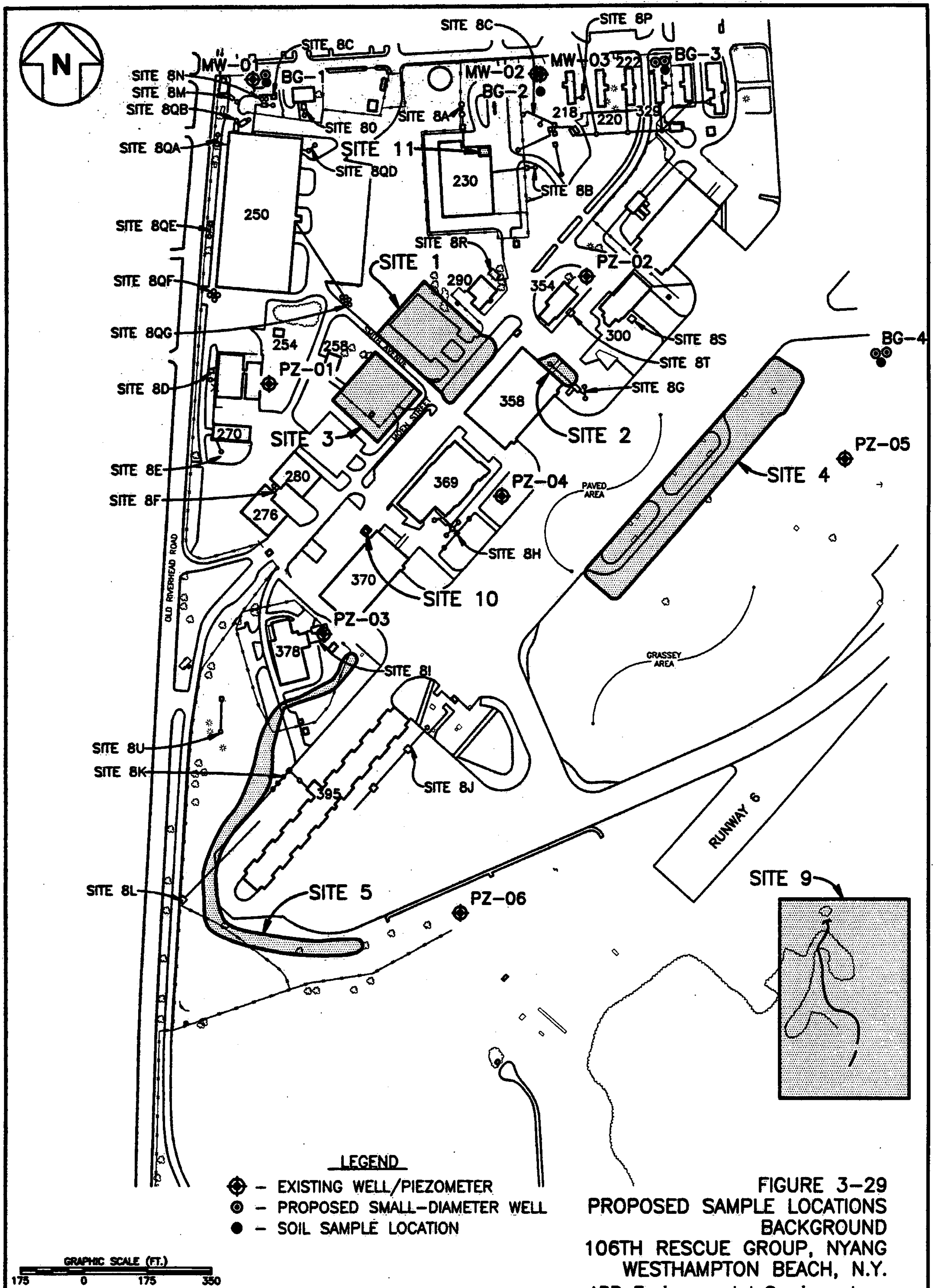


FIGURE 3-29
PROPOSED SAMPLE LOCATIONS
BACKGROUND
106TH RESCUE GROUP, NYANG
WESTHAMPTON BEACH, N.Y.
ABB Environmental Services, Inc.

3.7.12.2 Constituents

Constituents of concern include all constituents of concern from the various sites across the base: these are VOCs, SVOCs, and metals.

3.7.12.3 Hydrogeologic Conditions

Depth to ground water varies across the base and is expected to range from approximately 10 to 45 feet bgs. This assumption is based on measurements taken from the existing piezometers and monitor wells. Soils encountered during installation of the piezometers and wells consisted of medium-grained sand with a trace of gravel.

3.7.12.4 Migration/Release Pathway

Some areas of the base may be affected by off-site sources. Solvents, fuel, and oil released from these other sources may have migrated downward until they reached the water table, then would have migrated generally in the direction of ground-water movement.

3.7.12.5 Affected Media

Media affected by the potential releases would be soil and ground water.

3.7.12.6 Sampling Strategy

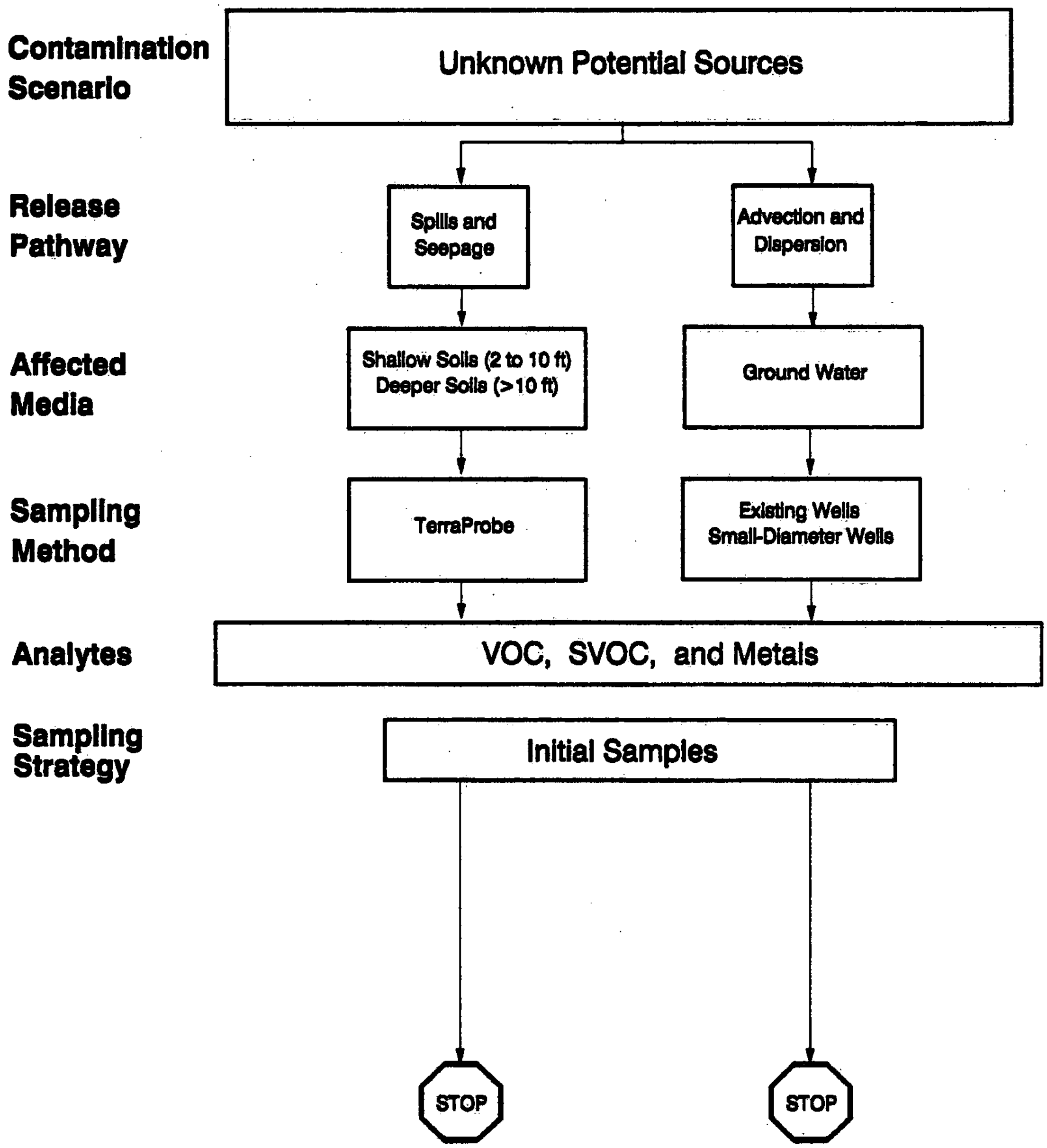
A background sampling program was developed for the purpose of comparing background soil and ground-water quality with the soil and ground-water quality established for each of the sites under investigation during this SI. The background sampling program for this SI covers four locations at the base (Figure 3-29). The first location, BG-1, is in the northwest corner of the base near monitor well MW-01. The second background location, BG-2, is near monitor wells MW-02 and MW-03 near the north-central boundary of the base. The third background sampling location, BG-3, is near Building 329 in the extreme northeast corner of the base. The fourth and final location, BG-4, is northeast of Site 4. Surface soils, shallow and deep subsurface soils, and shallow and deep ground water will be sampled at each background location as indicated on the Sampling Logic Diagram (Figure 3-30). Background locations for surface water and sediments are not available.

The soil samples will be collected by advancing borings with a TerraProbe at the four background locations. The surface soil samples will be collected from 0 to 2 feet bgs and the shallow subsurface soil samples from 5 to 7 feet bgs. The deep subsurface soil samples will be collected from 10 to 12 feet bgs, 20 to 22 feet bgs, 30 to 32 feet bgs, 40 to 42 feet bgs, and 55 to 57 feet bgs. A total of four surface soil samples, four shallow subsurface soil samples, and 20 deep subsurface soil samples will be collected.

Two rounds of shallow and deep ground-water samples will also be collected at each of the background locations. The samples will be collected from existing monitor wells and from newly installed small-diameter wells set with the CPT rig. Two shallow monitor wells, MW-01 and MW-02, currently exist at background locations BG-1 and BG-2, respectively. A deep monitor well, MW-03, is also present at background location BG-2 and is nested with an existing shallow well (MW-02). No monitor wells exist at the other background locations.

A deep, small-diameter well will be installed with the CPT rig within three feet of the shallow monitor well MW-01 at background location BG-1. A shallow and deep, small-diameter well pair will be installed at background locations BG-3 and BG-4. No small-diameter wells will be installed at background location BG-2 because a shallow and deep monitor well pair already

**Figure 3-30 Sampling Logic Diagram
Background
106th Rescue Group
New York Air National Guard**



exists at this location. Ground-water samples will be collected from all the existing monitor wells and newly installed small-diameter wells at the background locations. Eight shallow ground-water and eight deep ground-water samples will be collected from the background locations.

A total of 44 samples will be collected from the background locations. The samples will be analyzed for VOCs, SVOCs, and metals in the on-site analytical laboratory.

3.7.13 Preliminary Source Characterization of Septic Tanks and Cesspools

In addition to evaluating environmental contamination, preliminary source characterization of Site 8 will be completed at the end of the field phase of the SI. This characterization will be completed to provide additional information for evaluating potential sources and is not considered a component of the SI. Results of the preliminary source characterization will be submitted in a separate document.

Sludges in septic tanks and cesspools which were not sampled during the initial field activity will be sampled and analyzed after the SI field phase and before demobilization. During the initial field activity, 29 septic tanks, cesspools, distribution boxes, and dry wells were investigated (ABB-ES, 1992). Septic tank/cesspool clusters to be investigated include subsites 8M through 8U. Sludges from these structures were not sampled during the initial field activity. In addition, sludge from septic tanks/cesspools in subsites 8A through 8L that were not sampled during the initial field activity due to inaccessibility will be attempted again. Sludge will be collected and analyzed from at least 69 structures.

Access to the septic tanks/cesspools will be through existing manholes. The sludge samples (one per structure) will be collected using a sludge sampler. These samples will be analyzed in the on-site laboratory for VOCs, SVOCs, and metals.

3.8 Preliminary Risk Evaluation

The preliminary risk evaluation has been eliminated from the SI. If the results of the SI confirm contamination requiring immediate action, a Focused Feasibility Study may be developed to determine the appropriate remedial measure(s) to address contamination. Otherwise, a Remedial Investigation (RI) may be conducted to confirm the nature and extent of contamination found as a result of the SI or to obtain the information required for a Decision Document/Record of Decision. A risk assessment is typically conducted as part of the Remedial Investigation to evaluate the potential impact of the site on human health and the environment.

4.0 REPORTING

4.1 DATA SUMMARIES

ABB-ES' Knoxville office will receive data on a daily basis during the field operation. This data will be transferred to HAZWRAP and ANGRC through a variety of medias and frequencies. Daily verbal communication will be maintained to discuss various management and technical issues and to provide progress updates. Maps, tables, and graphs will be prepared and presented after acceptable review has been completed. Files of analytical results will be electronically transferred to HAZWRAP's subcontractor on a weekly basis.

4.2 SITE INVESTIGATION REPORT

The SI report will be completed after completion of the SI field activities. The report will include interpretations of data generated during the field activities and will provide conclusions regarding those interpretations. The report will also provide recommendations which may identify sites requiring immediate action or sites requiring confirmational data to support a Decision Document. The contents of the report will include the following:

- Executive Summary
- Background
- Methodologies
- General Hydrogeology
- Site-By-Site Reports
- Conclusions and Recommendations

4.3 Preliminary Source Characterization Results (Site 8)

The results of the Preliminary Source Characterization at Site 8 - Old Base Septic Systems will be presented as a separate report. This letter report will include:

- chronological description of the sampling activities;
- sampling methodologies;
- analytical results of the sludge samples; and
- figures showing the locations of the sampled structures.

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5.0 SCHEDULE

The SI field effort is expected to last approximately 14 weeks. This includes mobilization of the field laboratories, sample equipment, CPT subcontractor, and field crew. It also includes clearing sample locations for utilities and surveying baselines. Before the field work begins, a kick-off meeting will be held at the base to review the planned activities. During the site investigation, weekly debriefings will be held to discuss shift review checklists and plans for the next week. At the completion of the SI field work and the Site 8 preliminary source characterization, the investigation-derived waste will be staged for disposal, a debriefing meeting will be held with the base, and the equipment and trailers will be demobilized. Table 5-1 outlines the schedule for the field phase of the SI.

Table 5-1
Proposed Duration of SI and Preliminary Source Characterization

106th Rescue Group
New York Air National Guard

MOBILIZATION	3 Weeks
Mobilize Lab Trailers Hook-up Utilities at Trailers (electrical, phone) Establish Baselines Stake and Clear Locations Utility maps Base civil engineering department Ground penetrating radar Set-up Lab Set-up Database(s)	
KICK-OFF MEETING WITH BASE PERSONNEL	1 Day
SI FIELD WORK*	6 Weeks
Collection and Analysis of: Surface soils, sediments, subsurface soils, and ground-water (1st and 2nd rounds) * Weekly Item - Friday morning debriefing meetings Shift review checklists Summarize accomplishments for the week Review plans for following week	
PRELIMINARY SOURCE CHARACTERIZATION, SITE 8	3 Weeks
DEMOBILIZATION	2 Weeks
Debriefing Meeting with Base Personnel Stage Investigation-Derived Waste Unhook Utilities and Remove Trailers Abandon Small-Diameter Wells	

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